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Original Articles

Indications for the Treatment of Acute Appendicitis, from the Standpoint of the Surgeon

BY MOSES BEHREND, M.D.

Surgeon to the Jewish and Mount Sinai Hospitals, Philadelphia

Notwithstanding the voluminous literature collected since appendicitis became a distinct entity, the surgeon still meets too many advanced cases where pus and gangrene of the appendix are present. Despite all the educational propaganda among the laymen, there still is too little realization of the fact that appendicitis is a dangerous disease. The freezing of the appendix is still deeply rooted in the minds of the laity —in fact a physician is often not called because, the diagnosis being easy, the ever-ready ice-bag is applied, much to the detriment of the patient. The ice-bag is followed in many instances by the ice-box. Although the intensive educational propaganda of the surgeon ought to be heeded, the physician often errs in not referring his patient early enough to the surgeon; instead he still resorts to morphine and purgation. While these infractions are not as numerous as they have been, still, in recent discussions of the subject, various physicians admitted that they prescribe morphine for pain in appendicitis. Purgation does not seem to be nearly as detrimental as morphine on account of the masked symptoms the latter produces. The purge intensifies the pain, necessitating earlier surgical interference.

A factor which has seemingly minimized the necessity for operation is the idea that victims of first attacks of appendicitis always get well. While this is true in a measure it has worked to the detriment of the patient because the physician and patient have developed a false sense of security that the patient will get well without an operation. Many pus cases can be attributed to the desire to wait for symptoms to subside and avoid operation. While it is admitted that many recover from first attacks, it is just as pertinent to remember that an interval operation is the ideal one for an appendectomy. It ought to be an axiom that a second attack should be avoided, but if a second attack should occur an immediate operation should be performed.

Realizing then that acute appendicitis is a dangerous and fatal affection if not operated upon, a consideration of the various types may be interesting. It is difficult to believe that a patient in perfect health may have a fulminating appendicitis in a few hours, but such a case came under my notice a few days ago. A man perfectly well on Christmas day was awakened suddenly at 6 A.M. Sunday morning with severe pain in the abdomen. Dr. Eshner saw him at 6:30, and at 8 A.M. I confirmed the diagnosis of appendicitis. About 10 A.M. the operation was completed. We found the appendix swollen, engorged, and full of pus. Strange as it may seem, pus in considerable quantity had been formed in less

than four hours, in a man who never had a symptom of any kind referable to the gastrointestinal tract. In most cases, however, there is a history of previous slight attacks. When the resistance is lowered pus formation goes on rapidly. This type of case seems to be particularly prevalent in children, for which occurrence no satisfactory explanation has been given. From this very rapid type there exist, then, all grades of inflammation, including an appendix containing pus bound by adhesions to the cecum, an appendix bound down to the omentum lying in a pool of pus, the free gangrenous appendix much dilated, dark in color, and almost ready to burst, the appendix ruptured, which has caused an abscess in the pelvis along the cecum and around the liver, and then those neglected cases in which there is general suppurative peritonitis for which little or nothing can be done. The appendix may be located in any part of the abdomen, giving rise to symptoms simulating any intra-abdominal condition. The appendix has been found deep in the pelvis attached to the sigmoid and urinary bladder, and as high as the lesser peritoneal cavity between the liver and stomach. Again the appendix has been found at all levels between these two extremes ante- and post-cecal. A left-sided appendix is not unknown, but usually this means that the tip of the appendix is in or near the left iliac fossa.

When the appendix is high it is most important to differentiate it from gall-bladder disease, acute pancreatitis, and perforation of a gastric or duodenal ulcer. When the appendix is low it must be differentiated from stone in the ureter and gynecological conditions.

The clear-cut symptoms of pain followed by vomiting and rigidity in the right iliac fossa cannot be mistaken for anything else. The same may be said of acute cholelithiasis when the pain is in the right upper quadrant, usually coming on in the early hours of the morning and requiring a hypodermic of morphine to control the pain. The attack may or may not be followed by jaundice, but when the latter does occur it is good confirmatory evidence of gall-stones. Appendicitis may be mistaken for gall-bladder disease when the appendix is high, encroaching on the gall-bladder.

Acute pancreatitis is difficult to diagnose, the pain being usually in the epigastric region or to the left of the median line. The pain is very severe, requiring several hypodermics of morphine to relieve the patient. Vomiting follows, and there is great prostration following these attacks.

Before a gastric or duodenal ulcer perforates there is a previous history of indigestion which has existed for a long time. The perforation occurs, the pain, which is intense, beginning in the upper abdomen and rapidly spreading to the entire abdomen, followed quickly by a board-like rigidity.

Many cases have been operated on for acute appendicitis when actually a stone in the ureter was present. This is determined later when the symptoms return; an *x*-ray is taken, which reveals the true diagnosis. I have operated on two cases which illustrate this point. The differentiation from gynecological conditions will no doubt be discussed by the speaker to whom this subject has been allotted.

No one will depend on a leucocyte count to make a diagnosis of appendicitis. It is a well-established fact that the leucocyte count confirms the presence of an inflammatory condition in the abdomen. Greater dependence must be placed on the physical signs than upon the leucocyte count. When the leucocytosis is low a high polymorphonuclear count gives an index as to the degree of inflammation present.

The only treatment for acute appendicitis is immediate operation. There may be some exceptions, depending on one's ability to be able to diagnose the degree of inflammation. This can readily be done by palpation; the ends of one's fingers can be educated to discern, so to speak, the progress of the disease. One might call it intuition, but it is necessary to support your analysis of the case with a large experience in the diagnosis of this condition. The ability to tell the de-

gree of inflammation is especially useful in those cases that we see at the end of our day's work, cases that have been studied a little too long. In some of these there is no objection to order "nothing by mouth, Fowler position, and the Murphy drip." Cases so selected for operation are in better condition in the morning than they were the previous night, because invariably the treatment has reduced the inflammatory process. In my early practice I operated on these cases all hours of the night and day, but there is no question in my mind that there are many cases that do not require operation at once. This is not the Ochsner treatment, which will be discussed later.

Pus cases may be encountered illustrating all varieties mentioned previously, and upon these depend our course of procedure as to the type of incision, drainage, and so on. A good rule in all pus cases is that there must be deep anesthesia to prevent peristalsis, and the forcing of the intestines through the incision must be prevented. Next in importance is a quick operation; the average time consumed in a pus case ought not to be more than fifteen minutes. It is obvious that a midline incision should not be made on account of the spread of the infection to the general peritoneal cavity. A loin incision is of the greatest importance when the pus is localized and a distinct mass is felt. The appendix in this case is found either post-cecal or lateral to the cecum. Drainage is used in all cases in which there is free pus in the abdomen, and in the very severe cases the wound is sewn with through-and-through sutures of silkworm-gut. No attempt is made at tier suturing; the wound, in other words, is left open, just enough sutures being used to prevent extrusion of the intestines.

A great deal has been said and written about leaving the appendix in some pus cases. It has been my rule to remove the appendix in every instance, with beneficial results. There is no doubt that it is better to remove the appendix in all cases provided the proper incision has been selected and the abdominal pads have been placed properly to prevent the spread of infection. It is essential in all these cases to get in and out as quickly as possible.

The greatest difference of opinion exists among surgeons as to the proper method of handling a case in which we believe there is a spreading peritonitis. There are two opinions: those who believe in waiting several days until the pus becomes localized, and those who believe in immediate operation on every case. There is no question that considerable confusion has been created in the mind of the general practitioner by those who advocate the Ochsner treatment. No doubt the habit of treating cases too long has been in a measure due to the physician's hazy conception of what the Ochsner treatment means. The Ochsner treatment should not be used unless the physician has considerable practical experience in classifying the different types and the different stages in which he finds the appendix.

There does not seem to be any question that the longer the products of inflammation remain the greater will be the pathology and consequently the more difficult will be the operation. The complications such as fecal fistula and intestinal obstruction will also be more frequent. It has been our custom not to use the Ochsner treatment, but to operate on all our cases immediately with the exceptions noted above. Our mortality of about one per cent compares favorably with those who use the Ochsner treatment.

In conclusion, greater care should be exercised by the general practitioner in referring his cases earlier to the surgeon.

This will reduce the number of drainage cases, which later are nearly always followed by an incisional hernia.

Some types of acute appendicitis ought to be operated on at once.

Others are benefited by a rest of a few hours by instituting the Fowler-Murphy treatment.

Children should be operated on at once on account of the peculiarity of the appendix to undergo rapid inflammatory changes.

The ability to diagnose the position and degree of inflammation depends solely on one's experience.

While the value of the leucocyte count is not underestimated, the diagnosis of acute appendicitis is determined by physical examination. A leucocytosis is simply confirmatory evidence.

In all pus cases one must get in and out as quickly as possible. Deep anesthesia is important.

The appendix is removed in every case.

The Ochsner treatment is no doubt valuable in the hands of those who understand its application.

The writer never uses the Ochsner treatment. A mortality of less than one per cent compares favorably with the results of surgeons who advocate this treatment.

Chlorine as a Therapeutic Agent

BY M. B. HALLDORSON, M.D.
Winnipeg, Canada.

In May, 1916, the writer of the following lines read a paper before the North Dakota Medical Society with the above title, and where the use of chlorine solution was recommended in certain conditions, especially in the treatment of pneumonia and tuberculosis. This paper was published in *The Journal-Lancet,* October 15, 1916, an extract appearing in the THERAPEUTIC GAZETTE of January 15, 1917. February 15, 1919, there appeared in the THERAPEUTIC GAZETTE another article from the same source entitled "Chlorine in the Treatment of Pneumonia," reporting seventy-two cases of pneumonia with one death, but otherwise perfect results—*i.e.,* "complete recovery regardless of complications"—and giving a detailed account of how chlorine solution should be made and dispensed in order to give the best results.

As far as the writer knows (with the exception of a very few inquiries) these articles were, if read at all, promptly forgotten. This could be expected. A paper which, contrary to the accepted ideas, advocated a drug in the treatment of pneumonia and tuberculosis of the lungs would naturally be passed up as a freak idea or a plain folly, probably both. It is, however, to reiterate what I have already said about chlorine and to give further evidence of its value as a remedy in diseases of the lungs that these lines are written.

First, as to pneumonia. Shortly after the article on "Chlorine in the Treatment of Pneumonia" was written, which was in September, 1918, the influenza epidemic broke out. I was then somewhat at sea, wondering whether or not chlorine would be of value in pneumonia complicating influenza as well as in ordinary pneumonia cases. Consequently I treated the influenza on general principles, keeping a sharp lookout for lung consolidation, and when pneumonia appeared, prescribed chlorine. This I kept up during the first three weeks of the epidemic with satisfactory results, excepting that I lost one case of pneumonia, which I think I could have saved had I prescribed chlorine in the beginning of the disease before extensive lung consolidation had taken place. I then began to prescribe chlorine in all cases of influenza, whether or not pneumonia had appeared, with the result that I have had but one more death from influenza since, when chlorine was given before the lungs were involved. I had six more influenza pneumonia patients die between November 1, 1918, and April 1, 1919, but in all these both lungs were involved before I saw the patient and all had the virulent hemorrhagic form. Since April 1, 1919, I have had no deaths from pneumonia.

Altogether one hundred and eighty-five cases of pneumonia have been treated by this method since November 1, 1918 (I have kept no account of influenza cases where

the lungs showed no signs of consolidation), with eight deaths, or 4.9 per cent. When it is considered that this was in the same place and at the same time that local hospitals had been losing 50 per cent and over of their pneumonia cases (and then had done as well as the average), the difference in results can easily be seen. I have noted this difference, however, between influenza pneumonia and the ordinary lobar pneumonia: that while chlorine can be expected to be of value at almost any stage of the latter, in the case of the former it is usually useless in the later or last stages. This is as would be expected, since the pneumococcus is only an attenuated strain of the more destructive streptococcus. The only safe way with influenza is to give chlorine from the start, for if pneumonia then appears the chances are it will run a mild course and without complications. At least this has been my experience so far, for out of these one hundred and eighty-five cases I have had no complications outside of throat and middle-ear trouble, excepting one case of empyema in a Christian Scientist who refused all medical treatment for a week from the time she became ill. Six of these cases were pregnant women; the seventh developed pneumonia in childbed. Five of the former became very ill, but all recovered, although one aborted. One had a rather mild attack. The childbed case also recovered after a hard struggle.

These one hundred and eighty-five cases with eight deaths, together with the seventy-two pneumonia cases previously reported, with one death, give a total of two hundred and fifty-seven cases with nine deaths—a death-rate of 3.5 per cent, 4.9 per cent for the influenza pneumonia and 1.4 per cent for lobar pneumonia.

It would seem that a death-rate of only a small fraction of what could ordinarily be expected in over two hundred and fifty cases of any disease ought to prove the value of the treatment employed, sufficient to make it worth using without any further evidence. But when it is also considered that chlorine is not a drug in the ordinary sense of the word, but one of the most important substances that go to make up the human body—the most active one at that—since its principal salt forms a large part of the blood plasma, its acid a very important ingredient of the gastric juice, and that in the form of normal salt solution it is used every day in surgery to combat acute infections, it would seem only reasonable to presume that it is valuable in medicine. The fact is, what normal saline is to surgery, chlorine is to medicine, at least as far as combating the streptococcus (including the pneumococcus) and the bacillus tuberculosis is concerned. Neither one is a cure-all, but both are very valuable. My first attempt at using chlorine in pneumonia was by giving normal saline hypodermically in a desperate case. It brought on crisis and saved the patient, and for the ten years following, 1904 to 1914, I used to leave salt tablets with my pneumonia patient with directions to dissolve them in the water the patient drank. I lost one adult and one child from pneumonia during these ten years. But I kept no account of the cases, so cannot give the death-rate. But it is an interesting fact, and shows how slow and stupid a man may be, that although I began to use chlorine for tuberculosis as early as August, 1906, it took me eight years to catch on to the use of it for pneumonia.

Second, as to tuberculosis. As just stated I have used chlorine for tuberculosis infection since August, 1906: I tried it at first as a last resort in a case of far-advanced pulmonary tuberculosis and got unmistakable results. This patient, in spite of a life of work, want, and worry, lived for three years and seven months after treatment was commenced.

Since then I have treated, all told, fully four hundred cases of pulmonary tuberculosis, ranging in severity from "borderland" or "pretubercular" cases without any definite physical signs, but with the ordinary symptoms of oncoming lung trouble, to those in the very last stages of pulmonary consumption, with so uniform and gratifying results that the use of

chlorine in tuberculosis is no longer an experiment with me but an established treatment, where I expect definite results under given conditions, as one would expect from the use of mercury in syphilis, salicylates in rheumatism, and quinine in malaria. Thus I know when a patient comes to me in the "pretubercular" stage (which is a topsy-turvy term, for that is really the purely tubercular stage, before any mixed infection sets in), or even in the incipient stage, that patient is going to get well without going away from home or giving up his work. In the second or moderately far-advanced stage he will have to give up all work, take regulated rest and exercise, and probably go to bed for a while. In the third stage any treatment, including chlorine, is apt to fail (though I must say in all fairness that some of the results I have had even in that stage have been exceedingly gratifying) as far as improvement is concerned: for the reason that here the lung tissue has often so far been destroyed that insufficient amount remains to supply the necessary amount of oxygen to the body, and because of the involvement of other organs, such as the kidneys, larynx, bowels, and Fallopian tubes. Failure here means that the patient does not recover; not that the drug proves altogether useless, for such cases are the rarest exception. I cannot count ten cases in all my experience in which chlorine proved of no value whatever.

I have been doing this absolutely without the aid of an institution of any kind, for the reason that I was anxious to find out and to be able to show what an average physician can do with tuberculosis if properly instructed; because it is the average physician, the family physician, who must solve the tuberculosis problem if it is ever solved. It is to him that the patient goes first and last—before he is sent to an institution, and when he comes back again—and it is very often on him, his ability to diagnose early, and the efficacy of his treatment, that the life of the patient depends. It is well known how pulmonary tuberculosis usually comes on, slowly and insidiously, with malaise, loss of appetite and weight, a cough perhaps, but always with afternoon temperature, which I believe is the surest sign of oncoming lung trouble we have. In a multitude of cases in which a patient with the above symptoms fails to improve under ordinary treatment the physician suspects pulmonary tuberculosis, but hesitates to express his fears and thus subject his patient to all the fuss, expense, and inconvenience that goes with being sent away from home for treatment, let alone being branded as a "T. B." case. For this reason he goes on hoping that the patient will take a turn for the better, until he is forced to make the truth known, often after the patient's vitality is so far undermined that he goes on to his grave in spite of any treatment.

All this is very human and perfectly natural, and it will always be so until "there is something for it"—some remedy which the physician can prescribe for these patients and which can be relied on to bring on improvement, or at least retard the process of destruction going on in his lungs. This remedy we have in chlorine, have always had if we had only known it. This will sound as a bold statement, but it is based on sixteen years' experience with fully four hundred patients. In all that time I have never seen a patient fail to improve and get better, no matter how acute the case, if treatment was begun before extensive destruction had started in the lungs. And with the exception of two cases following profuse hemorrhages and one following influenza, I have never witnessed that rapid wasting which may be seen anywhere both in and outside the sanatoria, in which a well-nourished body is reduced to a skeleton in a few weeks, while the lungs literally melt away.

This is not saying that all a physician needs to do in a case of pulmonary tuberculosis is to prescribe chlorine and sit back and watch the patient get better. It often is in border-land cases—*i.e.*, before destruction of the lung parenchyma has taken

place. But on the whole it must be said that chlorine is not a substitute for but an addition to the modern treatment of tuberculosis. But so valuable an addition is it that no patient who dies of lung tuberculosis has had a proper chance for his life unless it has been employed. There is no doubt that better results than I have had can be obtained in a hospital or sanatorium (for the difficulties of treatment in the home are often great) by adding the chlorine treatment to the ordinary régime. That goes without saying. I am here stating only what an ordinary physician can do in the course of his practice. The other I have still to find out, and I will do so as soon as I can attach myself to some institution of that kind. Treating without an institution has the great disadvantage that it is impossible to give exact figures, but it has the distinct advantages of getting the patients at the beginning of their illness, and that one can watch over them indefinitely if necessary, which is often impossible after they leave an institution.

Chlorine bears the same relation to tuberculosis as mercury does to syphilis. Both are valuable in the first stages, but equally inefficacious in the last stages. A great deal of the value of chlorine lies in its protection of the lungs, *i.e.*, its antitubercular influence, and that it may be used in any case of common cold or bronchitis which will not yield to the ordinary mode of treatment. A common cold may be kept up by a chronic infection anywhere along the respiratory tract, such as a tooth abscess, infected tonsils, chronic nasal trouble, and last, but not least, infected bronchial glands. This last source is the most treacherous because it is the hardest to get at, yet at the same time the source of nearly all chronic lung disease; therefore, if neglected, fraught with the gravest consequences.

It is very important to remember that the source of the majority of chronic lung disease cases is the bronchial gland, and that the disease spreads or makes its way from this source to the lung parenchyma along the lymphatics surrounding the bronchial tubes, causing peribronchial thickening. This is why the ordinary classification of lung tuberculosis is so unsatisfactory. It is like inspecting the branches and leaves of a tree while forgetting all about its trunk and roots. And for this same reason the examination of lungs without an *x*-ray plate is never complete, for the bronchial gland infection and peribronchial thickening give no physical signs excepting slight dulness on percussion, which is usually overlooked.

As long as tuberculoss is confined to the lymphatic system, where it always begins, it is easy to control, excepting in the rare instances where a broken-down gland attaches itself to a large lymphatic vessel or a vein and suddenly floods the system with toxins as in acute phthisis. It may or may not give definite symptoms, but if progressing the patient's health is being undermined, and sooner or later, unless the process be stopped, the patient will become a consumptive. Thousands upon thousands pass through this stage every year, being treated for the principal symptom—cough, indigestion, loss of strength and weight, insomnia, anemia, or whatever the symptom may be—and in spite of the fact that universal tuberculous infection is now conceded and any one may be considered a possible case, end up as consumptives because the physician in charge failed to see beyond the symptoms he was treating. Or as stated above, he realized what was going on but hesitated to subject his patient to all the odium and expense which goes with being a tuberculous patient, and, as also stated above, he will keep on doing this until he has a remedy at hand which he can prescribe and get results.

In these cases, whether or not physical signs of lung involvement can be found, but where symptoms and the *x*-ray plate show oncoming lung trouble, chlorine is exceedingly useful. It is always perfectly harmless, the only discomfort it may cause being a slight irritability of the stomach when given in too large doses, and it is surprising how often the patient will report feeling better in a week or so, and will

simply keep on improving without more ado until he has fully recovered. Of course it cannot be predicted how long it will take; that depends on conditions which will always have to be more or less guessed at. But the important part is that he recovers. It is very important to treat promptly without waiting for physical signs, for physical signs mean lung involvement, *i.e.*, involvement of lung parenchyma, and that again means destruction of the part involved. For there is no such a thing as restoration of function to a lung area once invaded by tuberculosis. That part is gone as far as function is concerned, and the best that can be obtained by any treatment is a scar, a patch of fibrous tissue holding as prisoners a number of living, more or less virulent bacilli, ready to break away and make trouble any time the vigilance of the watchman, whoever he may be, is relaxed. For this reason tuberculous patients, no matter how well they recover, must be watched forever after, must be taught what their exact condition is, that their trouble in the same or a different form may return at any time, and that eternal vigilance is their price of good health.

What I have been saying above applies in the same way or even more so to children. I am perfectly satisfied that it is possible to take any number of children in ordinary health, and by properly watching over them keep them indefinitely free from destructive tuberculosis. In children, tuberculosis is always confined to the lymphatic system to begin with, and any attempt to spread to other parts of the system is met by a strong reaction. I feel satisfied that a great many more or less prolonged fever spells which so many children are subject to, and where the cause cannot be found, are really due to sudden escape of toxin from an infected gland which may or may not lead to the starting up of trouble elsewhere if left alone, but which if taken care of will go no further. I base this statement on the fact that since I began to use chlorine as a tonic, as well as for certain types of fever in children, which was in 1910, I have not seen a case of any form of tuberculosis develop in a child while under my care.

DOSAGE AND METHOD OF PREPARING.

There is but one form of chlorine that can be used in medicine (outside of inhaling the gas, which I have never found of much use); this is the watery solution. I have been using a solution made as follows:

> Sod. chlorate, gr. xl;
> Acid. hydrochlor., f℥iij;
> Aquæ destillatæ, f℥xvj.

Place the sodium chlorate freshly ground in a quart bottle preferably with a glass stopper, add to this the hydrochloric acid, and let stand without heating for a minute or two until the salt is fairly well dissolved; then remove stopper carefully and at arm's length and add about an ounce of water. Now shake vigorously. Keep on alternately adding water and shaking until there are sixteen ounces in the bottle.

When large quantities are needed chlorine solution may be made by charging distilled water from gas cylinders. But for small quantities the above method will answer the purpose.

If properly made chlorine solution should have a rich olive-green color and strong chlorine odor. *Care must be taken that the chemicals combine properly or the solution will contain free hydrochloric acid*, giving an unpleasant acid taste to the mixture. Whenever chlorine solution is used in a mixture it should be put in last, the other ingredients being well shaken up before it is added.

Chlorine solution may be given in doses of two to four teaspoonfuls in a tumblerful of milk or buttermilk as often as indicated. It is the best form to use in acute tuberculosis. But on account of its disagreeable taste and odor it ordinarily has to be combined with a vehicle of some kind. Because of its extreme activity very few substances will combine with it properly. As a matter of fact the only satisfactory vehicles I have found so far are the lighter extracts of cod-liver oil, especially those made by Parke, Davis & Co. (Palatol) or Frosst of Montreal (Elix. Gaduine Co.).

The heavier extracts throw down a precipitate when combined with chlorine solution and so do all other substances I have so far tried. I use the name "Palatol" or "Elix. Gad. Co." so that there can be no mistake about what is meant. Formerly I would simply put down "Extr. Ol. Morrh.," and some druggists instead of using the extract of cod-liver oil would put in the emulsion of cod-liver oil, which with chlorine makes a most horrible mixture, unpalatable and undigestible. For this reason I now write my prescription as follows:

℞ Sol. chlori,
Palatol or Elix. Gaduinæ, ää f℥iv.
Sig.: Dose as given below.

Nearly every druggist when given this prescription will have to be taught how to put it up, and usually will have to be watched until he has become fairly well accustomed to compounding it. In preparing chlorine solution, either sodium or potassium chlorate may be used, but the sodium salt seems to dissolve better with hydrochloric acid and to make a better solution.

The dose in pneumonia is half an ounce of the above mixture every three hours until crisis comes. Then it may be given before meals and at bedtime as long as it seems to be agreeing with the patient, or as long as the attending physician deems its use necessary. To children under six years a teaspoonful may be given, and to those between six and twelve, two teaspoonfuls. Larger doses produce no ill effects. I have seen a two-year-old child drink as much as four ounces of the mixture with impunity, but larger doses than here given are apt to produce stomach irritation with loss of appetite when long continued, which disappear as soon as the drug is discontinued.

In acute tuberculosis and influenza the dose is the same as in pneumonia. In chronic tuberculosis a tablespoonful of the same mixture may be given before meals and at bedtime, and this kept up as long as the patient's appetite remains good, or until stomach irritation is produced, when it may be discontinued for a week or so and then given again in somewhat smaller doses. In very mild cases the quantity of chlorine solution may be reduced to 3 ounces to 5 of the vehicle. Thin people unless they are putting on weight will have to be watched very closely. The hyperacidity will promptly disappear if alkaline salts, as soda bicarbonate, are given.

The effect of chlorine seems to be purely systemic, and I have learned to look upon it as a plain neutralizer of toxins. For this reason its effect varies greatly in "open" cases with mixed infections in accordance with the difference in toxins produced by different germs. In very chronic cases with few systemic symptoms, extensive lung destruction, and few if any tuberculous bacilli in the sputum, it is often of little value, and the same may be said of tubercular joint trouble after the bone has become involved. Again, it may be depended on in all forms of serous membrane involvement, synovitis, peritonitis, pleuritis, and even to a limited extent in meningitis. But dealing with lung tuberculosis it must never be forgotten that once the disease has advanced to such extent that insufficient amount remains to carry on proper oxygenation of the blood, all remedies fail, for it is no more possible to run a human body without lungs than a car without a carburetor.

CONCLUSIONS.

1. Chlorine in the form given above is one of the most useful drugs of the entire Pharmacopœia. It is of value in the treatment of practically all medical diseases of the lungs and respiratory tract, common colds, bronchitis, pneumonia, influenza, and tuberculosis, in children and adults alike. It is indicated wherever these diseases are treated in sanatoria, city clinics, hospital wards, and private practice.

2. It positively must be properly understood and prepared to give the best results.

401 Boyd Building.

The Aims and Duties of the Student[1]

BY HOBART AMORY HARE, M.D.

Professor of Therapeutics and Diagnosis in the Jefferson Medical College of Philadelphia

It has fallen to my lot as the senior member of the Faculty in point of service, but by no means the senior in point of years, to welcome the old boys back to the halls and wards with which they are familiar, and to say to the new boys that they are equally welcome and will soon be made to feel at home in the somewhat large but nevertheless very friendly Jefferson family.

The custom of an introductory lecture has been in existence for the ninety-six years that the College has existed, and this custom probably will continue to exist because it affords the Faculty an opportunity to meet with the entire student body at the beginning of each year, a meeting which does not take place throughout the course or even at the time of graduation. Again, this excellent custom will persist because it affords the College authorities an opportunity to place before the student body certain facts which it should understand, and finally because it is an example of the team work which is essential to success.

In the first place it is essential that every student shall understand that he must place himself in a receptive state of mind. Some students I have known have seemed to think that it is the duty of an instructor to drive ideas into the head with a hammer, or, by means of some trephine, bore an opening through the calvarium and force knowledge in. Nothing can be more erroneous than this idea, because teaching, like water and electricity, always goes in the direction of least resistance, and as there are many students avid for instruction they receive the energy of the teacher and thrive accordingly. Whether it be babies in an orphan asylum, prisoners in a jail, boys in school, or students in the sciences, it is inevitable that the individuals who take readily what is coming to them thrive best. Let me assure you that nothing is more discouraging to a teacher than to have to lead a horse to water and then try to make him drink, and nothing is so encouraging as to deal with thoroughbreds, which are always willing even if they are not clever.

Again let me say to you that students in the past have oftentimes developed the extraordinary idea that the various subjects which they have to learn are erected like hurdles, or obstructions, between them and the degree they covet. They train to jump these hurdles, and having succeeded, pay no more heed to them than if they had been actual hurdles. Occasionally they trip on one hurdle and have to go back and try again. This in school parlance is called a "condition"—why I do not quite know, for from a horseman's point of view the horse is "out of condition," and from the faculty point of view the man is in a *sad* condition. When he fails to go over several hurdles he is disqualified and has to repeat all the jumps. Now I can tell you a very remarkable fact; to wit, that it is surprising how many men, who fail to clear one or all the hurdles, wake up to the fact that it is their own fault, not for lack of brains, but because they have been lazy or wilfully non-receptive, and I have had men weep with disappointment when "thrown" who have told me in later life that they actually thanked me in their hearts for having waked them up to their duty so that they have achieved success.

Pursuing this same theme, namely, that students often think of the course and their instructors as impediments put in their way, let me tell you that the curriculum has been built as a stone house is built, by master masons. Years of experience have taught your teachers that certain things must be learned or acquired in definite order so that

[1]Part of an address delivered on the opening of the ninety-sixth course of the Jefferson Medical College.

other things may be comprehended and learned. The process of teaching is a process of construction, and so let me urge you not only to regard each branch as you tackle it as of importance for the time being, but of equal importance to you as undergraduates and as graduates. For a student to study chemistry or physiology, or any other elementary but fundamental subject, and then, having passed an examination, to throw aside that subject as he tackles another, is like a mason who is so foolish as to loosen several stones which go to form an arch as he adds other stones. In other words, these subjects of study are not obstructive but constructive, and lastingly constructive, so that when you have been practicing thirty or forty years you will be glad you kept them fresh in your mind, as you will find they help you every day. I venture to say that there is not a member of the Faculty who does not regret that he failed to regard with sufficient care many things that were taught to him as a student. When, therefore, you finally get your degree of M.D. it should not mean that you have successfully jumped so many obstructions at the end of each year, but to mix my metaphor, that you have built a house of learning of which the diploma is the mark of completion.

At the risk of being tiresome, let me say once more that the student who does not do his best to obtain and retain all that the course offers is laming himself in a race he has voluntarily entered. The man who does not keep as much as possible of the elementary branches fresh in his mind finds it difficult to grasp the advanced branches, not because they are in themselves difficult, but because he is difficult. No one of you would expect a child who had never learned ordinary arithmetic to keep up with other children who had learned it.

There is another aspect of this matter. If you regard the fundamental things you are taught as stupid, or useless, or grasp them only for a time for the low purpose of passing an examination, you will probably fail to amount to anything afterwards. You will not be trained in constructive thought, you will not see in practice anything but a business of making money, and as you do not grasp the whole subject as a concrete thing you won't make a living.

There are some men who walk the path of life as does the lowly jackass, which passes everything by without notice and without any idea of what things represent. They are often worthy persons who rarely bray except at the sight of food, or a mate, and who only kick when the flies of life get intolerable, and when they do kick they at most cause amused surprise, and do not greatly disturb the flies. There are other men who tread the paths of life with a keen appreciation of everything about them, who remember what they have learned and utilize that learning in their daily life, who see in each thing they learn how it can be applied to an end, and who go through life triumphant, happy and complete. They are so active that they have given rise to the slang expression "there are no flies on him," and so you do not hear of their kicking; indeed, when a man is a constant kicker he is probably in the jackass class.

There is one thing lacking in a stupid man, namely, "imagination." If he had imagination he would not be stupid, and if it were possible for a stupid man to have imagination he would be unhappy.

The possessor of imagination may be blessed by it and cursed by it, for if used properly it is a value and if utilized improperly it is awful. In some individuals imagination gallops off with their judgment, so that they are in much the same position as Mazeppa strapped to the back of a wild horse. In still others, in whom the fire of imagination burns brightly and normally, being under as complete control as is the fire in an open grate, it warms the heart, gives zest to life, leads to success, and makes the daily task interesting and joyful. In the man with a dormant imagination, or in the man who possesses no imagination, the practice of medicine, or of any other pursuit, is a road which "leads upward all the way; yes, to the very end." He leads a

leaden existence because "a primrose by the river's brim, a yellow primrose is to him, and nothing more." Such an unfortunate individual may be considered to lead his life in narrow alleys in which the sunlight rarely falls, while he who has a well-developed and well-controlled imagination walks in wide avenues filled with sunshine and fresh air. Imagination gives talent to the artist, the sculptor, the author, the investigator, the explorer, and not least to the medical man. It changes wearying toil into enjoyable exercise. Without it the world would cease to advance, for if there was no image in the minds of men of what may be found by research, toward what goal could they strive? It took imagination to conceive the telegraph, the telephone, the multiplied uses of electricity, for the development of the science of bacteriology, preventive medicine, and modern therapeutics, and, for that matter, all the advances known to the world.

Laennec, the great French clinician, seeing a child amuse itself by listening at one end of a log while another child struck the other end with a stone, had his imagination stirred and devised the stethoscope, and Bell seeing a child strike two stones together under the water while another child submerged its head, to hear the noise transmitted through the water, got his first glimpse of the telephone.

Imagination made Cope a great paleontologist and sent Leidy through his life surrounded by beautiful things, some of them ugly to the ignorant and unimaginative, but all of them lovely when viewed through his imaginative eyes. So lowly a thing as a rhizopod, or the flora and fauna of the intestinal canal of the rat, possessed interest and beauty for him when studied with the aid of his imagination, and they appear beautiful, even to us, when we examine the pictures of these organisms which he drew from life.

Sometimes persons who know nothing of medicine express surprise that we find it interesting or even tolerable as a pursuit. They do not know that if we have the real ardor and imagination, we see in every case of disease alterations from the normal which are just as striking to us, and more important to humanity, than the wonders of Niagara, or the magnificent splendor of a raging sea, nor do they appreciate that in combating each individual disease we see the natural history of normal function distorted. We see the imaginative and sympathetic aspect of the case, the varying mental attitudes of the relatives of the sick man, some of whom allow their imagination to distress them and to destroy their judgment, while others seem stupefied and inert, regarding the sick man as an onlooker would regard a ship tossed on the rocks by the sea, feeling that they are powerless to be of service.

The laity often fail to understand that by the use of our imagination we devise means to prevent other wrecks, whereas the ordinary onlooker at a shipwreck sees only the existence of a horrible catastrophe and rarely thinks out a plan whereby another calamity can be put aside.

He who knows nothing of the subject cannot understand how a medical man can see in a morbid growth, a typhoid ulcer, or the swollen glands of bubonic plage, as interesting changes in the life history of cells as a botanist sees in the development of a flower and the artist sees in the changing colors of a sunset. While to the lay mind such a statement may seem excessive, to the trained mind, which can put aside that which at first appears disgusting, the fact is evident, and, furthermore, by the use of the imaginative faculty we not only study the pathological process which is present in a single individual, but determine how we may prevent its recurrence in generations yet unborn. As I have already said, what more dreary life, filled with misery, can be found than that of the medical man who has no imagination? He sees in a cancer only pain, toxemia, and an offensive slough. What more hopeful and buoyant life than that of the medical man who sees before him the actual processes involved, and who strives to aid in the better conception of the disease in order

that he may have not only a comfortable glow of knowledge but the joy of efficient service?

The man in the street sees that which interests him in a great crowd, pushing and jostling, and his interest is intensified if it begins to do damage, but he rarely goes so far as to allow his imagination to analyze the causes for the presence of the crowd, or to consider the ultimate results of its existence. The physician at the bedside in the presence of acute inflammation sees in his imagination, as he would see actually through a microscope, another crowd composed of red blood cells passing rapidly along the center of the stream with lazy white cells lagging along the walls of the vessels, just as the members of the crowd on its margin stop and look in the windows of the stores. An accident occurs and the crowd of cells hesitate; the lazy white cells stop and soon begin to wander out into the adjacent parts. So many of them gather, with the object of out-wandering, that the vessel is soon completely blocked at the point of excitement. Other abnormal changes occur and, possibly, local death takes place, and after this the physician once more clearly sees in his mind's eye the wonderful processes by which nature clears up the results of the disaster, completely restores the part, or walls it off, when restoration is impossible, with far greater efficiency than it could be done by human hands. With these facts before him the medical man sees in a case of inflammation a complete study in natural history, and by the use of his imagination, coupled with investigation, develops measures to control a similar process if it arises in another individual.

But the physician who uses only his imagination in studying the disease of his patient without also studying his mental processes, and those of his friends and relatives, has only in part fulfilled his office and done little for his success as a practitioner. The imagination should tell the physician that each mind differs from its fellow in health and still more so in the presence of disease, and that changes in mental processes develop in the friends and relatives as well. Under these circumstances the physician's ability by the use of his imagination, to put himself in the place of the patient, or his friends, will enable him not only to treat the patient successfully, but to be a source of comfort and support. In the carelessness of youth and under the benumbing effects of long experience there is always the danger of regarding what to us is an every-day experience as being of little moment to the patient, and, not rarely, it is only when the physician becomes ill that the proposition seems peculiarly interesting and novel. Your imagination will let you see clearly that when a human being is traveling along a road that is beset with new conditions, and possible death, he is in quite a different position from the onlooker, who, standing "on the side lines," to use a football phrase, sees the sick man swept off his feet by a swirling flood of complications and then drag himself out on the hot path of his fever for another trudge.

Imagination will also often reveal the fact that the physician is not needed so much to minister to the patient who is ill as to those members of the family who, not stupefied by disease, are suffering from anxiety and distress.

There is still another bearing of this subject, namely, the use of the imagination in your intercourse with professional colleagues. If you use this faculty of the mind you will probably never be guilty of a breach of professional ethics or discourtesy, for you will be continually imagining how you would feel if you were in the other man's place. When as young practitioners you start out, filled with knowledge, your imagination will picture to you the way you will feel when, as a practitioner of thirty or forty years, you see a youngster settle in your town to be a competitor. Such a view will tell you how to act toward your senior, and your imagination had better go far enough to recognize that, while you may know many things taught by books, your older colleague knows many things taught by experience.

Imagination enables us to put ourselves

in the other man's place and to see things as he sees them instead of as we see them. It therefore makes us just instead of unjust, merciful, and tolerant, and he with such a lively imagination as to see things as others see them is sure of success, since he has a broad view and knows others as well as himself.

Let us, then, have a well controlled imagination that adds to the joy of living for ourselves and others, always imagine that things will be better rather than worse, and if imagination seems to threaten our judgment, at least to think, before we push it aside as useless, how much worse things might have been rather than how bad they are.

Over the main portal of the College Building you will find these words: "Dii laboribus omnia vendunt," which being translated means "The gods sell all things to those that labor." You note that the gods do not give all things, but sell all things, to those that labor. That is, they deal justly in that he who labors gets what he deserves. This motto is one for all men to bear in mind, particularly at the present time when the idea is general that the gods *give* to those who do *not* labor. This view recently, and perhaps to-day, is endangering not only the safety of the individual, but the safety of the world.

In your professional lives you may think that the gods are pretty slow in making their sales. If so, remember to ask yourselves whether you have worked hard enough to justify the gods in selling you anything, and ask yourselves furthermore, even if you have labored, if your labor has been intelligent enough and constant enough to produce a result which the gods should reward. Effort must be applied to the point where it will produce results. The drowning man puts out so much effort that he hurries his sinking, whereas the cool-headed swimmer expending his strength wisely is saved.

With the preliminary training all of you have received there is not a man present who, if he devotes himself honestly to his studies, without grinding, cannot successfully obtain his degree. If any man loafs on the job he jeopardizes his chances, but if he takes his course as regularly as he takes his meals or takes his smoke his chance is good. Remember that you are entering a profession in which a mere knowledge of facts without reasoning ability is of little value. There is no profession in which reasoning is so essential, for man dealing with the widely varying reactions of human beings to disease in their physical and psychical states. You must from this day forward array facts, and some things that are not facts, in parallel columns, balance the columns well, and act accordingly. Years of experience are utilized in the army and navy to train men so they will reason well and quickly when the day of battle arrives. You are to train yourselves for a daily battle with disease all your lives, and upon your exercise of reason and judgment will the lives of others depend. Go to it, keep your eye on the ball, play the game, and you will find that the motto "Dii laboribus omnia vendunt" is wonderfully true.

And so, gentlemen, this address comes to an end. I trust what I have said may prove useful to you, and I beg you to remember that having enlisted under the banner of the Jefferson College and its Hospital it is not only your duty but to your interest to do so well here, and in future, that pride in her heart for you and in your hearts for her may never cease to live!

Notes on Treatment of Some Common Affections

BY CHARLES GREENE CUMSTON, M.D.

Privat-docent at the University of Geneva, Geneva, Switzerland.

I. The Prophylactic Treatment of Syphilitic Infection.—Acquired syphilitic infection remains a local process during the first few days following the appearance of the primary lesion, the treponema remaining in the initial sclerosis and afferent lymphatics and satellite lymph nodes. The organism probably does not pass this barrier to invade the body until the lapse of about eight to ten days. The use of arsenical medication in the very early days of the primary sore may result in sterilizing the patient.

The indications for this arsenical medication are in patients who have had coitus with an infected partner, and a certain number of instances in which this has been done in adult males and females, and even nurslings who had had every possible chance of having been infected, have given encouraging results. Submitted to arsenical intravenous medication before the initial lesion had appeared these patients never presented any trace of disease. These facts confirm Dr. Magon's experiment. He inoculated himself with serous fluid derived from a chancre, and then was immediately given an intravenous injection of arsenobenzol. He never presented any primary or secondary accidents, and the Wassermann test was invariably found negative.

This prophylactic treatment of syphilitic infection, consisting of two or three injections in increasing doses according to the usual rules, should be exclusively reserved for subjects who have perfectly valid cause to suspect that they have been infected with syphilis. The physician should use judgment and not resort to this treatment in every person coming to him with the story that he or she has indulged in suspicious coitus, because the number of cases of syphilophobia is large.

II. Rheumatismal Conjunctivitis.—There is not a physician or surgeon who has not to deal with cases of conjunctivitis in his clientele. Therefore I merely wish to call attention to a form of conjunctivitis whose causative factor is acute or chronic articular rheumatism, and which is likewise met with in middle-aged adults presenting an arthritic diathesis.

The cases of this ocular process that have come under my observation were somewhat as follows: The patient, a rheumatic and, therefore, arthritic, offers a simple conjunctivitis *with edema.* The lids are swollen, the conjunctiva, both palpebral and on the globe, is injected, and there is a trifling flow of clear transparent fluid containing few mucous shreds. Sometimes, however, the secretion may be frankly mucopurulent.

The subject will complain of a pricking sensation, especially marked in the afternoon and evening, and if questioned he will complain of joint or muscular pain. Such is briefly an outline of these cases.

In most instances it is enough to treat the rheumatism to produce an amelioration and later cure of the ocular manifestation, by the exhibition of sodium salicylate and the alkalies, but a local treatment will greatly hasten matters, and I can thoroughly recommend the following in these cases:

℞ Zinci sulph., 5 centigrammes;
Aquæ camphor,
Aquæ dest., ää 10 Cc.
F. S. A. Collyrium.

Sig.: One drop in each eye morning and night for six days.

As indicated the collyrium is used for six days. The patient should then cease its use and await events for six days. If after this time the conjunctivitis returns, the collyrium is again used for six days, and so on. In my experience this simple local treatment, combined with proper internal medication for the rheumatic diathesis, will result in a cure after one to two or perhaps three weeks.

Since we are on the subject of rheumatism I would suggest the following two

formulæ in cases of the acute articular form. The pain will be relieved by morning and evening frictions of the involved joints with the following:

℞ Methyl salicylate, 20 grammes;
Tinct. belladonnæ,
Tinct. hyoscyami,
Tinct. opii, ää 10 grammes;
Chloroformi, 4 grammes;
Liniment saponis, q. s. ad 250 Cc.

M. f. linimentum.

The following is a useful combination for internal use:

℞ Sodii salicylatis, 10 grammes;
Sodii bicarb., 3 grammes;
Aq. menth. pip., 50 Cc.;
Syrup. rub. idæi, q. s. ad 250 Cc.

M. S.: A soupspoonful four to six times daily.

It is hardly necessary to add that the heart and pleura should be strictly watched, and the very first evidence of the onset of endopericarditis requires a revulsion of the cardiac area and the permanent application of an ice-bag.

It is important to keep the bowels open with mild laxatives, such as a powder composed of equal parts of sodium and magnesium sulphate, while diuresis should be obtained by drinking freely of some ordinary diuretic decoction, such, for example, as cherry stems, much used on the Continent, and unquestionably very efficacious when a mild diuretic is required. Or a decoction of the flowers of scoparius may be used in its stead. I must confess that these milder measures are too much neglected by the profession in the United States, who are prone to prescribe the more powerful diuretics, to my mind quite needlessly.

For hyperthermia tepid balneation is indicated.

III. The Prophylaxis of Sudden Death in Diphtheria.—Sudden death during convalescence from diphtheria is due to a general intoxication of the organism by the toxins secreted by the specific bacillus. I would also add that some of the late accidents of diphtheria may result from the setting at liberty of the soluble toxin fixed to the bacterial lipoids and to those of the tissues in which the bacillus of diphtheria germinate. Antidiphtheric serum has neither a prophylactic nor curative action on the lesions produced by the constituent poisons of the bacillus, and it would likewise appear that the bactericidal sera in general are no more efficacious.

But antidiphtheric serum has an antitoxic action during the disease and may possibly ward off the late accidents by arresting the formation of the toxin and causing the rapid disappearance of the false membrane. Therefore, in order to get all that we can out of the serum treatment it should be begun at the very earliest possible time and repeated continually until all manifestation of the morbid process has disappeared.

I assume that at present it is admitted that the serum will not cure or control the late paralytic and cardiac complications of diphtheria, but some observers, among them Comly, Mongour, Soule, and Barbier, maintain that they have obtained some good results when the serum was injected as soon as an increase in the pulse-rate without a rise of temperature, weak cardiac contractions, and weakness of the cardiac sounds were detected. These observers repeat the injections in series—10 to 20 Cc. per day—for three to five days. I am unable to offer any personal opinion as to the success of this treatment, but I do know that in the past I have lost cases even when massive doses of serum were given.

After the false membrane has disappeared, during the phase of what I would term pseudoconvalescence, there are certain precautions that should invariably be taken, namely: (*a*) sustain the weakened organism; (*b*) watch the functions of the intestine, liver, and kidneys; (*c*) help the heart along; and (*d*) avoid any external cause which might determine syncope.

The general organic depression should be sustained by a light yet substantial diet, consisting of eggs, brain, and meats reduced to the state of pulp. In cases of paralysis of the velum palatinum, semisolid foods and thick broths are to be given, as

well as vegetable purées and creams, the patient being fed lying on the back. However, when there is albuminuria one must be content with an absolute milk diet.

Certain tonics may be utilized, such as cinchona or folia cocæ in the dose of two to four grammes daily, as well as a potion somewhat like the following:

℞ Ammonii acetatis, 2 to 4 grammes;
Syrup. ætheris (French Codex),
Cognac, ää 15 Cc.;
Syr. simplicis, q. s. ad. 90 Cc.

M. f. potion.

Sig.: Dessertspoonful 4 times a day.

The toxic products, retained or partially destroyed in the liver, are consumed in the blood and are eliminated by the renal glands. Therefore internal antisepsis has its indications, as well as renal stimulation, both of which are obtained by small, repeated doses of calomel.

To deal with the adynamia and collapse cardiac tonics must be exhibited as soon as the slightest change in the pulse is noted, which can be attributed to weakening of the heart. For this 2 to 3 Cc. of the following solution are to be injected in twenty-four hours:

℞ Strychninæ sulph., 1 centigramme;
Spartein. sulph., 10 centigrammes;
Aquæ destillatæ, 30 Cc.

M. f. solution for subcutaneous injection.

For the paralytic accidents the preparations of strychnine and nux vomica are useful, while in paralysis of the pneumogastric the use of the galvanic current—5 to 10 milliamperes—for ten to twenty minutes should be essayed. The electrodes are placed between the two tendons of the sternomastoid muscles, or the positive electrode may be placed on the front of the neck and the negative over the cardiac area. Faradization has been recommended in diaphragmatic paralysis.

Treatment must be persevered with even when cardiac collapse has developed or repeated syncope occurs, because some patients will recover, making a very slow convalescence.

On account of the depressive action of the toxin on the nerve centers the slightest external influence or movement may cause sudden death, so that subjects in this state of adynamia or those presenting "exertion" dyspnea with a pulse going up to 90 or 100 from merely turning in bed, should be kept in the most absolute calm and quiet. Therefore, if the patient is a child, all treatment of the nasal or buccal cavities must be postponed if the child objects, and all attempts at gavage must be given up if this frightens the little patient.

All feeding must be done with the patient lying in bed, and consequently for this as well as other obvious reasons the selection of the nurse is not a negligible matter.

IV. The Exhibition and Doses of Arsenical Preparations, Other than in Syphilis.—Arsenic can be introduced into the organism by mouth, subcutaneously, or by the rectum, and I would say at once that mouth administration offers greater danger to intolerance than when given hypodermically. It is generally conceded that arrhenal (sodii metharsenas) can be indifferently introduced by mouth or subcutaneously, but with the cacodylic products the production of cacodyle oxide is always to be feared when given by mouth.

Some observers—Gautier among them—maintain that the subcutaneous administration should alone be adopted, but others are not of this opinion. If solutions are used the active medicament should be properly diluted in an appropriate vehicle in order to diminish the irritating action of the product on the gastric mucosa, especially in elderly subjects whose digestive tract is less tolerant to arsenic than that of children and adults. Arsenic preparations should always be given at the end of meals.

When giving Fowler's solution some tincture of opium may be added in a potion in order to assure tolerance, as follows:

℞ Liq. potassii arsenitis,
Tinct. opii, ää m. x.;
Syr. simplicis, 25 Cc.;
Aquæ dest., q. s. ad 80 Cc.

M. S.: For a potion to be taken in three parts, one after each meal.

The exhibition of arsenical products in

pills is very practical. Sodium cacodylate can be given in pills of twenty-five centigrammes each, one, two or three pills to be taken daily according to indications.

A coating of gluten with a resinous excipient is an excellent way of preserving deliquescent products, and when given in pill form with this coating one knows the exact amount of the medicament ingested at each dose.

In order to avoid the rather frequent untoward incidents arising from oral exhibition, some observers have advised the rectal introduction of the drug. Highly diluted Fowler's solution has been used, 5 Cc. being injected into the rectum once to three times a day, using the following solution:

℞ Liq. potassii arsenitis, 5 Cc.;
Aquæ dest., 60 Cc.

In this way the patient will absorb from one-third to one centigramme of arsenous anhydride. Sodium cacodylate can be given per rectum in the dose of 5 to 7 centigrammes per day in place of Fowler's solution. But rectal injections are not without their disadvantages; the production of cacodyle oxide occurs, hence an odor of garlic in the breath. More important still is the development of diarrhea preceding proctitis, although the partisans of the rectal route state that these accidents are merely temporary and subside when the treatment is suspended for a few days.

However this may be, the hypodermic method is to my mind the only proper way to administer arsenical products when circumstances allow. In cases of gastric or duodenal ulcer, gastroenteritis, or cerebral anemia with vomiting, it cannot, of course, be given in any other way. Accidents due to intolerance are rare, or at least are very trifling should they arise, and Burlureaux was able in one case to inject 15 grammes —or nearly one-half ounce—of cacodylic acid in the space of seventy days. Personally, I have several times continued the hypodermic use of sodium cacodylate in the dose of thirty centigrammes daily for a considerable time. The minor inconveniences of the hypodermic use of arsenical products are pain—rarely very sharp—at the time of the injection, but this does not necessarily occur, and occasionally small indurated spots may develop at the point of the injection, lasting for a few hours or perhaps a day or two.

To avoid these mild accidents the solution used must not be too concentrated. It is prudent not to exceed a solution stronger than 5 per cent, especially if 10 centigrammes of cacodylate are to be injected at a dose. In these circumstances it is better to inject 2 Cc. of a 5-per-cent solution than 1 Cc. of a 10-per-cent solution. Of late years I have resorted almost entirely to intramuscular injections of the drug in the gluteal or hypogastric regions, and this should invariably be done if mercury cacodylate or mercury salicylarsenate is given.

Whenever resorting to arsenical treatment in a given case, there is one rule that offers no exception, viz., that in the duration and general progress of the treatment, both for the mineral compounds and organic preparations, the doses are to be progressive with intervals of rest, in order to avoid immunity to the drug acquired by long-continued use. Begin by small doses, increase them progressively, then decrease, and then have an interval of rest before recommencing the cycle.

Now, especially if organic preparations are given, begin with a small dose and rapidly reach the maximum, maintaining this for several days, and then cease for a time equal to that of the duration of the administration of the drug.

Some give an injection every second day; others during five, seven, ten days, with an equal interval of rest, but the principle remains the same with mere variations in the detail of application.

As to the doses, since they vary with each preparation, I need only recall that the mineral compounds are much more toxic than the organic products; therefore they should be proportionate to the strength of the given product in metalloid arsenic, usually represented by arsenous anhydride, which contains 75.757 per cent of arsenic.

For the organic preparations, the therapeutic doses vary in general between 2 and 10 centigrammes; 5 centigrammes may be said to be a good average.

Gautier observed that those tissues of the organism which are the richest in arsenic are at the same time those which contain the largest amount of iodine, and, on the other hand, that the elimination of arsenic by the menstrual blood is accompanied by a release of iodine whose proportion is notably greater than is normal blood—four and a half times, according to P. Bourcet. Therefore, Gautier suggested combining iodine with arsenical medication, especially in the form of potassium iodide. Some observers maintain that iodine aids in the elimination of arsenic, while others—among them Martinet—believe that KI simply acts as a reënforcing agent, and he consequently employs binary formulæ, namely, iodine arsenate and iodine cacodylate.

For these reasons adjuvant medication may be associated in the administration of arsenical products, such as the sirop-iodotannique of the French Codex—a highly efficient preparation when given in the proper cases.

Arsenic is present in minute quantities in a large number of waters, usually in the state of sodium or ferrum arsenate, and I here append a list of the better known Continental mineral waters with their arsenical content per 1000 Cc., according to the analyses of E. Willm:

La Bourboule (Source Perrière)	Na arseniate	0.0155 gramme
Royat (Grande Source)	Na arseniate	0.0008 "
Saint Nectaire (Source Mont Comadore)	Na arseniate	0.0015 "
Chapel-Guyon (Source Deval)	Na arseniate	0.0018 "
Vichy (Grande-Grille)	Na arseniate	0.0008 "
Vichy (Nêo-Célestino)	Na arseniate	0.0008 "
Plombières	Na arseniate	between 0.0004 and 0.0002 "
Mont-Dore	Na arseniate	0.001 "
Vals (Source Dominique)	Ferri arseniate	0.001 "

The water of the *Hamman-Meskoutin Spring* in Algeria contains one-half milligramme of arsenic per liter, while in Italy the *Levico* waters contain calcii arseniate 0.00905 gramme per liter.

V. Treatment of Nocturnal Enuresis.—Among the innumerable antispasmodics advocated in the past for the treatment of nocturnal incontinence of urine, chloral, antipyrin, belladonna and its alkaloid atropine are the only ones that have stood the test of time. Belladonna should be administered according to the indications given by Trousseau in progressively increasing doses: one centigramme of the extract every evening at bedtime, increasing the dose one centigramme every four or five days until fifteen to twenty centigrammes are reached. The maximum dose is then continued for several weeks and then progressively decreased.

However, atropine should be preferred to belladonna for several reasons. Atropine should be given in three doses—morning, noon, and night—in a spoonful of sugar-water, the following formula being ordered:

℞ Atropin. sulph., 1 centigramme;
Aquæ destillat., 10 Cc.

For young children it is well to commence with two drops of this solution three times daily and to increase the dose progressively until a maximum of fifteen to twenty drops is reached.

In children of six years of age, five drops three times daily will be the initial dose, and this is progressively increased to thirty drops a day. In children from thirteen to fourteen years of age, fifty or even sixty drops may be the maximum dose, beginning with ten drops thrice daily.

The maximum dose is continued for two or three days, and then the dose is progressively decreased. The medication is to be interrupted as soon as symptoms of intoxication are noted, such as dryness of the mouth, disturbance of the vision, etc. In about a fortnight it can be begun again, but with moderation.

Rhus aromaticus will sometimes act quite surprisingly in the control of enuresis, and some regard it as almost a specific. The drug is given in the form of a fluid extract in the dose of five, ten, up to thirty and sixty drops a day.

Antipyrin unquestionably will give results in some cases of nocturnal incontinence of urine. The drug should never be prescribed alone in the form of powder or cachet, because it has an irritating action on the

gastric mucosa which will give rise to pain with a burning sensation and pyrosis, sometimes even nausea and vomiting.

Antipyrin may be given in tablet form or cachets if an equal quantity of sodium bicarbonate be added, and followed by a cup of hot drink. Or a wineglassful of Vichy water may be taken, while the freeing of carbonic acid which results facilitates the tolerance by the gastric mucosa of the drug.

Antipyrin can also be given per rectum should occasion require it.

The time at which the drug is given is not indifferent, two hours being allowed between each dose. Besides, the nearer these doses are given to bedtime the more effective will be the drug in the control of the enuresis. For example, a child takes two grammes of antipyrin in twenty-four hours,[1] one at 6 P.M., the second at 8 P.M. He will not void urine probably until about 5 A.M. Now, if the drug is given at 9 P.M. and again at 11 P.M., the enuresis occurring in the second half of the night may be controlled.

A cure may sometimes be obtained from the very onset of this treatment, but the drug should be continued for at least a fortnight in order to have the good effect continued, all the more so for the reason that in some children the incontinence disappears while treatment is going on, but will return as soon as the drug is no longer given.

As a conclusion I think it safe to say that the results obtained by antipyrin are perhaps on the whole better than with any other drug, and it should be essayed because of its easy administration and absence of untoward effects. Children present a peculiar tolerance for the drug when combined with sodium bicarbonate.

Under the heading of surgical treatment I refer to retrorectal injections of saline solution as practiced by the late Professor Jaboulay of Lyons and Cathelin's procedure of injections of a saline solution or a 1-per-cent solution of cocaine in the epidural space. I can commend the latter procedure highly as giving excellent results, especially in obstinate cases, but to give the details of the technique would require too much space, so that I refer the reader to Cathelin's work entitled "Conferences Cliniques et Therapeutiques de Pratique Urinaire," 2d edition, Paris, 1912, for a description of the author's method in his own words.

I cannot insist too strongly on the important fact that the procedure must be carried out to the letter, otherwise failure in results is certain.

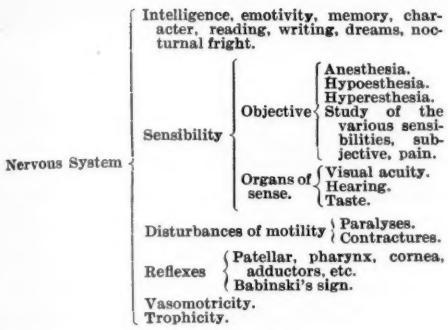
I would add that the removal of any factor producing disturbances of the peripheral nervous system must not be overlooked, especially the external genito-urinary organs of both sexes. Irrigations of potassium permanganate and instillations of argentic nitrate will quickly cure a vulvitis, non-specific urethritis, or balanoposthitis. Adhesions of the prepuce should be broken up, circumcision should be done if phimosis exists, and urethral polypi removed when present. The urethra should invariably be inspected, because from my own experience I have found polypi relatively common in male subjects of eight or more years of age.

Although this paper is strictly confined to treatment, I cannot refrain from appending the two following tables that I use in my lectures on the urological affections in children, because they outline the examination of the child who suffers from symptoms of the urinary organs, and nocturnal enuresis is certainly one of the most frequent with which the practitioner has to deal:

Genito-urinary System

- External organs: shape, congenital defects, discharge, adhesions.
- Urethra: polypi, catheterism, and resistance of the sphincter.
- Bladder
  - Catheterism, contents, calculus, neoplasms.
  - Vesical tolerance.
  - Frequency of micturition, incontinence, hematuria, pyuria.
- Kidneys: Pain, palpation, ballottement.
- Urine
  - Normal elements
    - Acidity.
    - Chlorides.
    - Phosphates.
    - Urea.
  - Abnormal elements
    - Albumin.
    - Sugar.
    - Indican, etc.
  - Epithelial elements.
  - Bacteriological examination, cultures, inoculations.

[1] We regard this as an unsafe dose.—ED.



To return to treatment, it goes without saying that both medical and surgical treatment may be combined with great benefit to the patient, but I prefer to resort to medication just because it will be more readily accepted by the parents, and later on, if medical treatment be of no avail, Cathelin's procedure can then be advised.

Let us now consider the treatment of the factors of enuresis which reside in the genito-urinary system. The affection may be due solely to an abnormal composition of the urine, an irritation of the vesical mucosa or sphincter of the posterior urethra. As to urinary incontinence having a chronic interstitial nephritis as the cause I must confess that no instance has ever come to me, therefore I can express no opinion.

With this exception, in all the other varieties of enuresis, the method of treatment will, in its general outline, be local, general, and of the nervous system.

The urine may be alkaline on account of fixation of the alkaline carbonates, without symptoms of cystitis. Therefore, in these circumstances the acid phosphate of sodium is indicated and given in quantities necessary to make the urine strictly neutral, because if too much of the drug is given the urine becomes acid and the enuresis will continue. On the other hand, the urine may be acid, so that sodium bicarbonates or alkaline mineral waters, such as Vichy, Vals, or Evian, should be given. Vesical irrigation with a tepid solution of a very mild boracic acid solution may also be essayed. The treatment should be continued for quite a time, otherwise recurrences are prone to occur.

Now if the urine contains urates, two grammes of lithium are to be taken daily for ten days each month, while during the remaining twenty days the waters of either Royat, Evian or Pouges should be taken, and I would likewise commend Contrexéville water in these cases especially.

At the same time a vegetable diet should be ordered, only a small quantity of white, lean meat being allowed, while if albumin is present a mixed vegetable and milk diet should be ordered, and dechloridation as well should circumstances require. As drinks, Vichy, Vals, Vittel, or Contrexéville waters are indicated.

Urotropin will give good results because the excess of phosphates irritates the vesical mucosa, and this irritation reacts on the spinal cord, inducing enuresis, so that the nervous system requires attention.

All the antispasmodics referred to can be resorted to with advantage—atropine, antipyrin, or chloral. The only contraindication for the first two drugs in incontinence is when albumin is present. If an olive-tip sound shows that the posterior urethra is sensitive and that the sphincter strongly contracts, and if the bladder allows a normal quantity of fluid, or a little more than the normal, to be injected into its cavity, these data indicate that there is excitation of the urethral sensitive system with integrity of the sphincter. Therefore sedatives are indicated for the nervous system, so that belladonna or atropine is essentially indicated and should give brilliant results, while antipyrin and chloral can also be administered during the interval of repose in the atropine medication.

If now the urethral mucosa is not abnormally sensitive and there is atony of the sphincter, the antispasmodics are to be formally rejected, and on the contrary stimulants such as strychnine and ergot are to be exhibited. Rectal massage and electrization of the sphincter will give excellent results. At the same time a general tonic treatment should be prescribed.

The bladder may be atonic or the sensibility of its mucosa may be found obtuse, although the tonicity of the sphincter is normal. In these circumstances the patient micturates from overflow, and if this occurs in the night the case is regarded as one of enuresis, which it is not. Therefore never give the antispasmodics, but, on the contrary, prescribe nux vomica or strychnine. Ergot will often be beneficial.

These cases are especially met with during the convalescence from serious affections such as typhoid fever, scarlatina, etc. A general tonic treatment and proper feeding are the best curative agents in the long run.

If a cystitis is the result of a gonococcal or colon bacillus infection daily, or every second day, irrigations with a 1:10,000 argentic nitrate solution or a 1:3000 protargol solution should be given, and if nitrate of silver is used—and in my experience none of the new silver preparations are half as effective—the solution can be progressively increased to the strength of 1:3000 to 1:1000 if required.

Tuberculous infection of the kidney is a not infrequent cause of enuresis at its onset, and here the correct diagnosis must be made and the offending kidney removed, which will cure the nocturnal incontinence.

I would in closing say that failure in treatment of nocturnal enuresis in children may be expected in all cases of degeneracy, and that enuresis symptomatic of a debilitated state of the general health will be rapidly ameliorated or cured by proper feeding and the exhibition of cod-liver oil and sodium cacodylate.

3 RUE BELLOT.

Chemical Changes in the Blood in Disease.

MYERS, in the *Journal of Laboratory and Clinical Medicine* for October, 1920, states that although the practical value to be derived from the estimation of the blood chlorides can hardly be compared with that of some of the other blood constituents already described, still it is believed that the preliminary estimation of the chloride content of the blood in cases of nephritis may often be of great assistance, particularly in indicating the extent to which chlorides should be restricted in the diet. Furthermore, this estimation should be utilized to determine when the blood chlorides have returned to their normal level. It is believed that in the past chloride restrictions have often been made when they were not indicated, and, when indicated, have been continued until in some cases the chlorides of the blood reached a subnormal concentration.

In general it may be stated that high blood chlorides have been found in nephritis, certain cardiac conditions, in anemia and some cases of malignancy (possibly due to an accompanying renal involvement), while low values have been observed notably in fevers, diabetes, and pneumonia. The chloride retention in most cases of nephritis apparently results from impaired renal function.

The excretion of chlorides and nitrogen seem to be fairly independent functions. In contrast to so-called parenchymatous nephritis, the function of excreting chlorides in interstitial nephritis appears to be much less impaired than that of excreting nitrogen. Consequently a restriction in the chloride intake in the latter condition may fairly quickly restore the chlorides to normal.

When cases of advanced nephritis with marked nitrogen retention are put on a restricted chloride diet it is sometimes noted that the blood chlorides drop to a subnormal level, such as is occasionally found in severe diabetes. A possible explanation for this is that, owing to the large amounts of urea and sugar present in the blood in these conditions, less chloride is needed to maintain normal osmotic conditions. This may also help to explain the increased blood chlorides in anemia.

It is of considerable interest that the chloride retention in pneumonia is associated with a decrease in the chloride concentration of the blood.

Editorial

DIAGNOSIS AND TREATMENT OF MYOCARDIAL INSUFFICIENCY.

In an excellent address which was delivered before the Canadian Medical Association during the past year by Greene, he emphasized one point which must have already become clear to many general practitioners, namely, that while there has been a great accumulation of scientific truth in regard to heart disease within the last few years, the patient has benefited but little, chiefly because some of the instruments of precision, by which a very accurate diagnosis can be reached, are quite out of the reach of the general practitioner not only because of their great cost, but also because it is impossible for the busy practitioner to become skilful in their manipulation.

Nevertheless it is the duty of every medical man to study this new knowledge in order that step by step he may be better qualified to treat patients belonging to a very large group of those who are ill, or of those who will certainly become ill if measures for their protection are not instituted.

The mass of material which was accumulated by medical men in the service of Great Britain and the United States during the war is so great that it is difficult to deal with it, and in all probability its very bulk will prevent us from obtaining from it the value which might be receved had the facts been accumulated more slowly and so been more readily given their proper value.

Again, as Greene pointed out, most of this material, or increased knowledge, is, after all, of little value to the middle-aged or elderly cardiopath since it deals with those who were of such an age that they could be taken into service, and does not deal with young persons who manifestly were cardiopaths and who, therefore, were not enlisted.

We have for many years in the columns of the THERAPEUTIC GAZETTE urged the point that almost the whole problem in cardiac disease rests with the condition of the heart muscle rather than with the state of a valve or valves which may be diseased. Twenty years ago the valvular lesion received much attention. To-day, except as an important collateral factor in the study of a case, it is properly ignored, and possibly no one has been more energetic in insisting upon a study of the myocardial state to the exclusion of the valvular lesion than Sir James MacKenzie. While many of us have recognized and taught this view, he, because of his remarkable researches with instruments of precision, has been in a position to enforce and emphasize his opinion.

Therefore it becomes manifest that many cases can be saved as to discomfort, and their lives prolonged, if the physician recognizes that an undue strain is being thrown upon the heart, and, more important still, appreciates the fact that the heart muscle has lost much of its pristine vigor either because it is fatigued or, more important still, because it has undergone more or less degenerative change with the result that its margin of safety is materially diminished.

There are a number of facts in regard to what might be given the popular term of "weak heart" which should be considered. During the war it was soon recognized that there was a class of patients who in ordinary life were not regarded as cardiopaths, but who were manifestly weak as to their cardiovascular apparatus from the moment of birth. Many of these cases were called "D. A. H." cases, and various other terms, such as neurocirculatory asthenia, were employed to cover them. These patients in many instances have a faulty physical development which is universal; long, thin chests which are shallow, and feeble hearts which have never

permitted the patient to enter into the vigorous sports and games of his comrades in childhood without distress. Something can be done if these cases are recognized at, or shortly after, puberty by graduated exercises and careful attention as to mode of life to increase the tone and development of the cardiovascular apparatus, but little can be done for them after they have reached mature years. Furthermore, this type of case, because of lack of resistance on the part of the cardiovascular apparatus, falls a victim to valvular or myocardial lesions during the course of acute infections more readily than does the normal individual, and so acquired lesions are superimposed upon congenital faults. In our belief courses of small doses of digitalis with arsenic should be given from time to time to these patients, not so much with the idea that the digitalis will act as a definite cardiac stimulant as that by recurring courses of this drug, with arsenic, a definite improvement in the development of the cardiovascular apparatus in the second and third decade of life may result.

There is too great a tendency on the part of the profession, however, to administer drugs in these cases rather than to recognize that the duty of the physician is to frankly discuss the condition with the patient and describe the method of living which should be followed, the chief point being on the one hand not to depress the patient with the thought that he had heart disease, but to inform him as to his limitations and to point out that just as a badly sprained ankle may cause him to be cautious for the rest of his life when attempting to run over rough ground, so the condition of his heart requires that it shall not be put to excessive stress and strain. Furthermore, such patients are prone to jump to the conclusion that they must live by brain work rather than by hand work and thereupon take up some profession or business which they think will require little physical effort. Manifestly this is a better course of life for them than hard labor, but on the other hand such patients often throw themselves into intellectual pursuits with extraordinary vigor and enthusiasm and entirely fail to recognize the fact that long-continued mental and nervous strain makes demands upon the heart and nervous system which a naturally feeble heart will not permit. Few persons appreciate the amount of energy which a heart is made to expend under prolonged keen mental activity, and in some instances it were better that the patient should lead a life upon a farm, without doing the hardest kind of work, rather than that he should enter an office where, while his general muscular system is at rest, his cardiovascular and nervous system is continually under stress.

Another point to which too little attention is given, but which is emphasized by Greene, is the recognition of the fact that after an acute illness it not infrequently happens that the heart is the weakest organ in the body, and yet the patient, within a short time after his temperature becomes normal, is allowed to get up and go about and often to pursue his ordinary avocation, with the result that his convalescence is greatly prolonged, or that sooner or later he suffers from a cardiac breakdown which may be brief or which may persist for the rest of his life. The great epidemic of influenza, fearful as it was, served to illustrate this point not only in regard to influenzal infections, but as to all other infections, in a way in which it had never been emphasized before, and it is true that since the great epidemic of 1889-90 physicians had been more and more impressed with the fact that the greatest care must be taken of the heart during convalescence from this type of infection.

In many instances the symptoms described by the patient are not definitely cardiac. He does not connect them with the condition of his heart, but with his digestive apparatus or with other functions, when in reality the disordered action of the liver, the stomach, or other organs is in reality dependent upon impaired circulation. Often these symptoms will clear up if the heart is given rest, and will not clear up by mere regulation of the diet and

the administration of digestive tonics. Too much emphasis cannot be laid upon this point, and it is unfortunate that even by the use of the electrocardiograph we may not be able to determine with scientific accuracy how weak the heart muscle is since this instrument of precision is of more importance in studying the condition of the different portions of the heart and of its conductivity than it is in determining that its functional ability as to vigor has become impaired.

THE IMPORTANCE OF THE SCHICK TEST IN THE PREVENTION OF DIPHTHERIA.

The introduction by Schick in 1913 of a method by which children susceptible to diphtheria may be recognized and protected from infection by isolation or immunization may be considered to have been as great an advance, if not a greater one, than the earlier introduction of diphtheria antitoxin for the cure of the disease when it is actually in existence.

The Schick test has now been employed in so many hundreds of thousands of cases that its position is as definitely established as is the position of vaccines, and although the principle involved is different, the results in diminishing morbidity and mortality may be considered similar.

Some skill, of course, is needed to see that the test fluid is injected intradermally and not subcutaneously, and this requires a good syringe and a fine needle, the needle being usually 26 gauge, care being taken that both it and the syringe are always sterilized by boiling or with alcohol. If alcohol is used, the syringe and needle must be freed of it by rinsing them with some diluted toxin, which is then discarded. Usually 0.2 to 0.3 Cc. of the properly diluted toxin is injected into the flexor surface of the right forearm two or three inches below the elbow, and a similar amount of heated diluted toxin used as a control is injected into the left forearm.

It is of great importance that the physician should be able to identify a true positive reaction. If the individual is susceptible to diphtheria within twenty-four to thirty-six hours there develops in the area where the unheated toxin is applied a zone of redness about half an inch or a little more in diameter. This gradually becomes markedly developed within the next forty-eight or seventy-two hours, and by the fourth or fifth day reaches its limit, persisting for seven or ten days, and on fading leaves a brownish area which desquamates and then fades, but often some pigmentation will remain at the spot several months. On the other hand, if the individual is not susceptible and the test is negative little change takes place in the appearance of the skin, or if it does, what is known as a pseudonegative reaction develops. Its redness appears somewhat earlier than the true test, reaches its full development at the end of twenty-four hours, and at the end of four days has almost entirely disappeared, although there may be very slight desquamation in the center.

It is also true that in some pseudoreactions there may be well-marked reddish pigmentation at the end of four days. It is supposed that this pseudoreaction is due to anaphylaxis, depending upon the protein in the injection, and if there is any doubt as to whether the reaction is true or false the differentiation may be made by using a control test on the opposite arm with a toxin which has been heated for ten minutes to 75° C. This heating destroys the toxin but does not affect the protein of the poison. In other words, the person who has given what is thought to be a pseudoreaction will show similar effects in the test and in the control lesion, whereas an indvidual in whom the test is positive will show the well-defined redness where the toxin has been used on the right forearm, and no reaction on the left forearm where the control test has been placed.

It is evident that the toxin used must be of standard strength, and it is also evident

that where the test is negative the child is protected by having within its own blood a sufficient amount of antitoxin, whereas in the presence of an epidemic if the test is positive an immunizing test should be given, or where there is no immediate danger of infection diphtheria prophylactic, that is toxin-antitoxin, should be administered. The advantage of toxin-antitoxin is the long period of immunity which it induces, which is supposed to last from six months to two years, whereas the immunity induced by antitoxin is much shorter than this. The disadvantage is that in the presence of an epidemic it does not act quickly enough, and under these circumstances the antitoxin should be employed.

A valuable paper upon this subject has been contributed to the *Journal of Laboratory and Clinical Medicine* by Zingher, who well says that the Schick test should be used in the home where the child has developed diphtheria to determine whether other members of the family, children or adults, are susceptible, and those that are susceptible should receive an immunizing dose of antitoxin. The same thing holds true in institutions and schools.

Another point of importance pointed out by Zingher is that in many thousands of tests it has been shown that children over two years of age who give negative reactions will continue to give such reactions over a period of years. In other words, a negative Schick test in a person who is naturally immune indicates a long and persistent immunity.

A word may be said in conclusion in regard to the method by which the toxin for the use of the Schick test is to be used. The toxin is sold put up in capillary tubes, accompanied by another tube or small vial containing salt solution in sufficient quantity of both to make ten tests, or in other instances in such bulk of each to make fifty tests. The contents of the tube containing the toxin is mixed with the contents of the vial of normal salt solution, and then 3 minims of the mixture is injected intradermally with the results already described.

THE PROPHYLAXIS OF SYPHILIS.

Whatever may be said in regard to the moral aspects of this question, it is universally recognized, by those who are well informed, that active measures for the prevention of syphilitic infection should be generally known and widely employed. There can be no doubt that the incidence of the disease has been markedly decreased by the dissemination of knowledge as to how it is acquired and by the early use of calomel ointment. Nevertheless, for various reasons, infections constantly take place, and therefore we are interested in a report which has been made by Michel and Goodman as to the prophylaxis of syphilis by the use of arsphenamine. It is evident that this method cannot have a very wide employment except in connection with institutions and in the hands of Health Boards. Goodman had an opportunity to treat a large number of males in the tropics who had been exposed to women who were in a large proportion syphilitic. These men were given a full dose of arsphenamine within forty-eight hours after exposure. Most of them were under observation for a comparatively short time, and therefore it is not possible to determine whether late manifestations occurred, but in a considerable number no primary lesion had developed after the ordinary period of incubation, or even as long as six months later.

More recently they have carried out this method in about thirty additional patients who had been exposed; that is, to persons in whom it was definitely possible to make a diagnosis of syphilis in an active stage in the opposing partner.

In these cases only 0.3 of arsphenamine was used, three doses being given at intervals varying from every other day to five days. In the patients treated in this manner a sufficient period has passed, over and above the ordinary time of incubation, to render it probable that infection has not occurred, and, furthermore, no patient so treated has developed a positive Wasser-

mann although repeated tests have been made.

These authors also quote two French clinicians who observed forty women who had been exposed to infection by reason of syphilitic partners, all of the latter being proved to be specific cases by the discovery of the spirochete, the Wassermann test being positive in all except five. The women were free of all suspicious lesions and the Wassermann was negative in all. None of them had used preventive measures, and not one of the forty ever showed any lesion or developed the Wassermann reaction, although twenty of them have been under observation over three years. Five women who refused all treatment, who were similarly exposed, were attacked later.

It would appear, therefore, that it is not only wise to use prophylaxis in the way of external applications, but where real exposure is suspected to resort to small intravenous doses of arsphenamine to make assurance doubly sure. Obviously larger doses should be employed if treatment is instituted late than if it is instituted early.

THE IMPORTANCE OF LEAD AS A POISON IN OBSCURE CASES.

Many years ago the late Horatio C. Wood taught that whenever a patient presented obscure nervous symptoms, so that a definite diagnosis was difficult, the physician should suspect the presence of syphilis or lead poisoning, and a host of eminent neurologists have from time to time emphasized the difficulty of making a differential diagnosis between the early manifestations of a true locomotor ataxia and the pseudotabes due to lead.

In England, Oliver has made a number of notable contributions to this subject, rather from the toxicological than from the neurological standpoint, and we have from time to time called attention to the fact that very brief exposures to lead as a toxic agent may induce subacute or chronic poisoning. Thus it will be recalled that one British investigator reported instances of chronic lead poisoning from the application of Goulard's extract, and others have reported it as a result of the application of diachylon plaster.

In some obscure cases the diagnosis is made possible by the administration of fairly full doses of iodide of potash or soda, so that a double soluble iodide of lead is formed, which being readily eliminated in the urine provides in this fluid a manifestation of the poisoning. This is important to remember because in some instances no lead will appear in the urine until the iodides are administered. Chapman has claimed that one-quarter to one-half milligram of lead per liter of urine indicates that enough lead is present to cause chronic lead poisoning.

Very recently McDonald and McCusker have reported a series of twelve cases, all of which presented nervous disorders of many types, but none of which showed the classical symptoms of lead poisoning, such as the blue line in the gums, anemia, or stippling of the blood cells, the diagnosis in all twelve cases being reached only by the urinary examinations. In one case the patient had worked in a paint shop as a paint scraper and suffered from right hemiplegia with aphasia, but presented no evidences of neurosyphilis. In another a right hemiplegia without aphasia developed, after a tooth extraction, in a carriage painter by trade. Here again lead was obtained in the urine. In another instance a man in excellent health in other respects suffered from severe migraine, and it was found that the house tap-water was contaminated with lead.

We are doubtful whether the cases of hemiplegia were due to the lead directly or indirectly, but the reports are interesting as emphasizing the importance of lead as an agent which is capable of producing obscure symptoms.

They also emphasize the importance of urinary examinations by chemical methods in obscure cases, and in some instances, if not in all, where syphilis is supposed to be the cause even if the patient presents a

positive Wassermann reaction, it will be well to remember, nevertheless, that a patient who has acquired this infectious disease may be a sufferer from lead poisoning and that his symptoms may be due to the latter cause rather than to syphilis.

ILLUMINATING GAS AS A FACTOR IN ILL HEALTH.

At a recent meeting of the Section on Ophthalmology of the College of Physicians of Philadelphia, Wilmer of Washington read a paper upon this subject, with special reference, of course, because of his distinguished position as an ophthalmologist, to the effect of slow or chronic gas poisoning upon vision. A very considerable portion of his paper, however, was devoted to the psychical and physical manifestations of such poisoning. Thus he reported instances where persons occupying certain premises, seemingly in perfect health, before long developed visual disturbances which were in the nature of hallucinations, a general loss of mental and physical vigor, and at times hallucinations as to sounds, all of which symptoms passed away on removal from the house in which these symptoms developed, although a considerable period of time elapsed before complete recovery occurred.

We call attention to this matter not only because it serves to impress upon us that in the treatment of certain symptoms we must look for illuminating gas as a cause, but also because it serves to impress upon the mind the fact that the physician should not alone treat the symptoms which arise in a given case, but should go further than this and discover the cause.

In the cases reported by Wilmer, it was not always illuminating gas, but gas which escaped from furnace flues or range flues in such a small quantity as not to be noticed by the inhabitants of the house, but in sufficient amount, over a lapse of considerable time of exposure, to produce very definite effects. In all instances where gas is responsible for the development of an evil turn of symptoms, carbon monoxide is the dominant factor, although in all probability other gases which are associated with it are to some extent responsible. In the case of ordinary illuminating gas made from coal, Remsen found the percentage of carbon monoxide 7.9, whereas in so-called water gas the percentage of carbon monoxide was 28.25.

Of course in the great majority of instances the characteristic odor of the illuminating gas reveals its presence and so the individual is warned. This is to some extent true of the gas which escapes from bad flues or stovepipes, and yet it is a well-recognized fact that if the quantity of gas is small the patient so readily becomes accustomed to its presence, so far as its odor is concerned, that he is unconscious of its existence and so continues to inhale it over a long period of time.

The changes in the body which are produced by exposure day after day for weeks at a time are little known: first, because such cases rarely come to autopsy, or, if they do, the underlying cause of the death is not recognized; but it seems to us, in view of Wilmer's contribution, that where an entire family suffers from ill health this question of gas as a causative factor should be carefully investigated. Possibly in some instances a change for the better in the health of a patient, or patients, which follows resort to another climate on the advice of the physician are not due so much to the climatic change as to escape from this cause of disease.

Closely allied to this matter of obscure causation of symptoms we must remember that sometimes drugs which are used as remedies produce symptoms for which treatment is administered, as in the case of incontinence of urine in children developing on the administration of iron or quinine, or the polyuria of infancy which is induced by the too free administration of sugar of milk. In the first case the child may be punished physically by the parent and medicinally by the doctor. In the second case the continued crying of a child because of thirst induced by polyuria results in

excessive feeding or in some modification of the food formula which is entirely unnecessary.

The real point is in studying disease or abnormal symptoms, to look for unusual causes as well as common ones.

ACUTE INFECTIONS OF THE HAND AND THEIR SURGICAL TREATMENT.

Since Kanavel's masterly brochure on this subject there has been a marked improvement in the results of treatment for acute infection of the hand. With a larger understanding of the anatomy, of the somewhat different directions in which from a given focus infection spreads, a better concept of adequate drainage, the cases in which either function was destroyed, the extremity lost, or even life itself sacrificed are now brought to a successful conclusion.

In spite of preventive measures—*i.e.*, sterilization of wounds, early care of skin infections, particularly those developing beneath the callouses—hand infections still remain common and a certain proportion of them end disastrously, often, but not always, incident to inadequate surgery. From which circumstance Coughlin's contribution on the subject (*New York Medical Journal,* Oct. 30, 1920) is of importance. He calls attention, first, to infection of the matrix of the nail, its persistence and the ease with which it may be promptly cured by removing that portion of the nail overlying the infected area, and applying a moist, mild saline dressing, supplemented by rest of the part. For infections of the fold of the nail he advises cutting through the fold backward from its free edge on each side until the incision reaches as far as the root of the nail extends, turning back the flap and examining the matrix to be sure it is not infected, removing the nail if there be pus under it, covering the raw surface with a thin bit of rubber, and putting on a wet dressing which is kept wet, the part being then immobilized.

Infection of the pulp of the distal phalanx calls for free incison. This relieves tension, and it is tension which causes death of the periosteum, the skin, the bone, and all the intervening tissues. It is noted, at the outset of periosteal suppuration, while the patient is complaining bitterly of the pain, there is very little swelling of the part or perhaps none whatever.

Careful examination will always reveal a point of maximum tenderness, which is to be found by pressing gently on the skin with a toothpick or some such pointed object. The patient can locate this spot very accurately. This tender point exists early in the disease before the infection has spread far or broken through the periosteum. Under the tenderest point between the periosteum and the bone is the seat of the trouble. Over this point is the place to open, and the knife point should reach the bone here only. A large incision is never needed if one can get the patient early. Often only a very small drop of pus is found. The process usually lasts two or three days before the periosteum gives way.

Knowing the pathology, course, and prognosis of infections, no sane man would counsel any other than surgical treatment; yet those who do not know advocate poulticing until the felon—for this a real felon —is "ripe."

The offending organisms in hand infections are usually the staphylococcus and the streptococcus, and the pus is thick and does not run out easily. Saline in which citrate of soda has been dissolved, two drachms to a pint, helps to thin the pus. So does Dakin's solution. Dress with gauze moistened in such a solution, change often, and keep the part at rest. Instead of the moist dressing, constant immersion in a hot bath of saline and citrate is often better.

Infection (metastatic) of the web of the first space is in a class by itself, inasmuch as it is nearly always intermuscular from the beginning. It follows infection of either thumb or index-finger and can occur by direct extension of pus along perifascial lymph spaces, or by the ordinary lymphatic route to the base of the thumb or index,

and then along muscle tendons into the intermuscular space between the first dorsal interosseus muscle and the adductors of the thumb. Tenderness on deep pressure is the sign to watch for, and the space should be opened as soon as that sign appears.

An abscess in this web can readily become a palmar abscess by dissecting its way around the edge of the adductors of the thumb, or along the palmar arch, or it can spread to the wrist along the synovial sheath of the flexor longus pollicis. In dealing with abscess in this web, no muscle is cut. Through-and-through drainage is never used.

The deep palmar fascia is strongest over the middle compartment, and over all compartments thins out, becomes cribriform, and finally fails entirely as we proceed distally. It disappears first in the interdigital spaces, leaving the digital vessels and nerves uncovered by it as they enter the webs of the fingers.

Here the superficial fat of palm and web becomes continuous with fat and areolar tissue under the deep palmar fascia. One can thus see how readily a primary superficial abscess can become a deep palmar abscess by direct extension, because the fascia forming the roofs of the palmar compartments is so strong and unyielding, and abscess in any of the compartments may spread well up into the wrist or forearm along the tendons or into its neighboring compartment long before it points on the surface of the palm. The swelling in the palm is for the same reason never marked until the abscess is well advanced.

Swelling on the back of the hand is always marked, but this swelling alone should not induce one to incise the dorsum. It is nearly always lymphedema, because the lymphatics drain toward the dorsum, but pus does sometimes collect here in the perifascial lymph space, and here as elsewhere localized deep tenderness is an early and never failing sign. The tender spot should be opened as soon as found. To "squeeze out" the pus is the most primitive surgery.

How to open a palmar abscess is a real problem, and whether to incise vertically or transversely is a moot question. A transverse incision will remain open better while the fingers are extended, and the fingers should always be dressed in extension, but a transverse incision in the lower part of the palm exposes the digital vessels and nerves to danger, while a vertical one higher up imperils the palmar arch.

The patient should be anesthetized and an Esmarch bandage applied. Cut down to the deep fascia and proceed with caution. Divide the deep fascia and then lay down the knife. If the opening has been made over the spot most tender on deep pressure, go straight on with blunt dissection until the pus appears. Do not pack, but insert soft rubber and fasten it in the wound. Any drainage material that presses on a tendon with any force for even a few hours may cause local death of the latter. If a tendon or part of one dies, it takes four to six weeks to separate and come away. Immobilize fingers, hand and wrist, keep fingers in extension, and use the hot bath or moist dressing.

When pus has invaded the great bursa at the wrist, the anterior annular ligament is cut through and the hand and fingers dressed in hyperextension and left so until healing is well advanced.

When the hot bath is used, the part must be kept on the splint while in the bath, and the solution should be as hot as can be borne without blistering. On no account should the temperature of the bath fall below 110° F. In weak patients it is not well to continue the bath day and night, because of fatiguing the patient; therefore during sleeping hours the part, still on the splint, is placed in large, hot packs wrung out of the solution and wrapped in waterproof cover, and the whole surrounded with hot-water bags which are frequently renewed.

If an infection of the palm is properly opened and treated as outlined above, the progress of the disease is quickly checked. The drains are removed in from three to ten days and the wound kept open so that

pus cannot be retained and burrow. Active motion is encouraged for a few minutes at a time two or three times daily as soon as the drains are removed, and gradually these periods of activity are increased and lengthened. Only those too long immobilized or improperly handled fail to regain useful function.

CANCER RESEARCH.

To one who has even casually followed the course of cancer research, an analysis of the results, summed up from his reading, will demonstrate that he is impressed with the extraordinary ingenuity exhibited by laboratory workers, the sometimes elaborate terminology devised by them, and the unvarying optimism and indefatigable energy exhibited in a pursuit which has thus far been not only futile, but not even largely encouraging.

Murray (*British Medical Journal*, Oct. 30, 1920) quotes this somewhat striking sentence: "Cancer research, the knight-errantry of medicine, presents 'a restless complication of bold hazards and miserable disappointments.'" He further states that the cancer cell is in some way different from the cells of the same kind among which it takes its origin and from which it arises. The nature of the change is still unknown. It is probably of a thorough-going kind and in most instances of a quite surprising degree of permanence. Nothing impresses this fact more strongly on the imagination than the behavior of the Jensen mouse carcinoma which has now been propagated continuously in normal mice for twenty years, and is structurally and biologically the same as when first transferred to normal animals.

All the differences which have been found so far between cancer cells and those of adult tissues can be paralleled in rapidly growing tissues of the embryo.

The one positive character of new growths is their progressive proliferation, uninfluenced by the forces limiting the increase of the elements of healthy or diseased tissues. The transplantable tumors of laboratory animals present this feature and its consequent problem in its purest and most clamant form.

Campbell explains carcinoma on the basis that it is an abortive attempt of the organism to reproduce itself asexually. This implies that the tumor must be regarded as a budding or outgrowth from the organism itself. The epithelial cells, being the least differentiated of all the cells in the body, are those which can most easily be referred to the ancestral germinal type. The conditions favorable to this reversion are degeneration of epithelial cells either from inherited tendency or cessation of function, and abundant supply of nourishment such as comes from local irritation.

Mottram notes that acquired resistance is found in animals that have absorbed inoculated cancer, the second inoculation being invariably negative. If, however, these animals be exposed to *x*-ray, inoculation tumor will result and persist until the effects of the radiation begin to be recovered from. Resistance can be induced against cancer inoculation by the inoculation of various tissues—embryo skin, spleen, blood, etc.—and also by the exposure to small doses of *x*-rays. This induced resistance is likewise destroyed by exposing the animal to comparatively large doses of *x*-rays. It has been seen that these three kinds of resistance have some common feature. In immune animals there is a lymphocytosis, as also there is in the artificially immunized animals. In man lymphocytosis is usually found in the early stages of the disease, but later leucopenia occurs. Profound exposure to *x*-rays causes a profound leucopenia, and at the same time destroys the resistant condition. On the other hand, repeated small doses of *x*-rays give rise to a lymphocytosis and an increased resistance to inoculation.

Russ quotes an experiment made by Murphy and Morten, who collected 52 mice with spontaneous tumors. Their technique was to remove the tumors, give the animals a single dose of *x*-rays, and reinoculate the animals with grafts of their own tumors.

One-half of the autologous grafts failed to grow. Out of 29 controls 28 autologous grafts took.

Leitsch, as the result of his experimental work, states that the susceptibility as well as the resistance is a variable condition. He does not accept the view of Freund and Kaminer that the blood serum of normal or non-cancerous individuals contains a substance capable of disintegrating cancer cells, whilst the serum of cancer patients is devoid of such protective property. From these and other experiments it is to be concluded that an animal does not develop an immunity to its own cells, normal or pathological.

Leitsch holds that the experimental tumors of animals have cleared our minds of many old encumbering fallacies and theories. They have taught us that however attractive speculations may be about the origin and cause of cancer, it is idle to indulge in them. They have helped us to get rid of much useless histological classification of tumors. And they have led us to look upon the neoplastic process as a thing apart—a peculiar response, but only one of the possible responses to widely different stimuli. Every one who has had an extensive experience of tumors realizes how difficult, or even impossible, it is on occasion to separate simple tumors, or even hyperplasias, from malignant tumors.

Apart from the investigation of tumors propagated through animals, which have given results more of academic than of practical value, laboratory researches have been conducted along other lines—(1) methods of diagnosis, (2) essays in chemiotherapy, and (3) surgical pathology. There has been a great cry for the earlier diagnosis of cancer. Patients will not seek medical advice before they experience symptoms, and symptoms are notoriously late in obtruding themselves in most cases of cancer. It is remarkable, too, how unobservant some patients are of signs and symptoms when they are well defined. But there is a field for research into possible laboratory methods of diagnosis where, on clinical judgment, it cannot certainly be made. The very fact that in malignant disease no condition of immunity in the wide sense is ever established would induce one to hope that evidence of antibody formation might be found in the blood serum because the so-called antibodies found in the serum in infectious diseases are probably to be regarded as expressions of injury rather than signs of defence. Crile claimed to be able to diagnose cancer with a fair degree of certainty by the fact that the serum of cancer patients hemolyzed normal red blood corpuscles, whilst the serum of non-cancerous cases produced no such change. It was then known that isohemolysis was a fairly common phenomenon, and it is now general knowledge that all human bloods can be grouped accordingly. He must have worked with rather unusual corpuscles in his tests. At any rate Leitsch found in repeating his work that the method was utterly devoid of any diagnostic value. For the complement deviation action of v. Dungern great diagnostic worth was claimed, and the claims were substantiated by some of his pupils. He employed an extract of carcinoma and subsequently an extract of red corpuscles as antigen, and the reaction followed the lines of the Wassermann technique. Coca, who worked in v. Dungern's laboratory, was unable to obtain successful results or even to have them demonstrated to him in that laboratory. The cancrolytic reaction of Freund and Kaminer has not been of any use to the author. The famous Abderhalden reaction was founded on a very attractive hypothesis; numerous papers from all parts of the world supported its great value in the diagnosis of cancer. The Abderhalden reaction is devoid of any practical diagnostic value.

The whole world, medical and lay, looks for the elaboration of some drug that will cure cancer, and many essays in the chemiotherapy of the disease have been made. The experiments of Wassermann and his collaborators with an eosin-selenium compound raised considerable expectations. The details of his experiments were far from convincing to any one familiar with

the behavior of transplantable tumors, and he was apparently never able either to repeat his successes or even to elaborate the same chemical substance again. It is difficult to conceive any chemical substance so selective in its action that it will destroy tumor cells and yet leave uninjured the normal cells from which they have sprung, seeing that chemical analyses fail to show any material or constant differences in constitution or metabolism between the one and the other. *X*-rays and radium are supposed by some to have this selective property. While one cannot deny that these agents may occasionally produce a local temporary amelioration, reliable evidence is still wanting that they ever bring about cure even in such low malignant lesions as rodent ulcer.

Surgery is, and is likely long to remain, the only means at our disposal of eradicating the disease, but surgical procedures must be based on sound pathology. There is here a fruitful field for the coöperation of the surgeon and the pathologist. The routes by which the disease spreads have only been worked out with any degree of thoroughness in cancer of the breast, uterus, and rectum, and even there the observations are not complete. Much remains still to be done for other organs, but it is interesting to know that in the situations mentioned the radical operative treatment in the hands of those surgeons who are conversant with the facts of surgical pathology gives a cure rate of about 40 per cent, taking as our standard of cure a five-year immunity from recurrence. Fifteen years ago such a success could not have been hoped for. The surgeons are slow in adopting them, but the results that have attended the operative measures built on pathological findings give encouragement for the future.

Progress in Therapeutics

Medical Therapeutics

The Effect of Thyroid, Thymus and Tethelin and a Meat Diet on Hypertrophy of the Thyroid.

LOEB, in the *Journal of Medical Research* for July-September, 1920, in summarizing his studies on guinea-pigs makes the following statements:

1. In contradistinction to iodine, which does not inhibit compensatory hypertrophy of the thyroid gland in the guinea-pig, feeding with thyroid tablets has a very marked inhibiting effect.

2. This effect is a direct and specific one, and it is not an indirect effect, called forth by the loss of weight which is induced through thyroid feeding. Iodine preparations given simultaneously with thyroid tablets do not counteract the effect of thyroid.

3. Feeding with thymus gland does not prevent thyroid hypertrophy. It is, however, possible that it diminishes the intensity and frequency of thyroid hypertrophy, although at present this cannot be stated definitely considering the variable factors which enter into the development of thyroid hypertrophy.

4. Repeated injections of tethelin do not noticeably influence the degree of thyroid hypertrophy which follows extirpation of the greater part of the thyroid gland.

5. A diet consisting principally, but not exclusively, of meat given to guinea-pigs during a period of three and one-half weeks does not produce hypertrophic changes in the thyroid gland; such a meat diet does neither prevent nor (according to his preliminary experiments) noticeably increase compensatory hypertrophy of the thyroid gland in the guinea-pig.

Frequent Types of Nasal Obstruction and Their Treatment.

ITTELSON, in the *New York Medical Journal* of October 30, 1920, states that a frequent condition in the nose is an obstruction due to the abnormal condition of the nasal mucous membrane. To perform its function of warming, moistening, filtering, and perhaps regulating the amount of the inspired air, this membrane expands and contracts, thus varying constantly the lumen of the nose. The causes responsible for this variation in dimension of the mucous membrane are often obscure, and to some extent depend on the function that is to be performed. Changes in the atmosphere, chemical and mechanical irritants, and mental emotions—all affect this highly susceptible membrane and cause it to expand and contract. This expansion is due to an increase in the blood supply, which distends the venous sinuses not unlike the erectile tissue elsewhere in the body, and with little or no inflammatory reaction. The term functional obstruction is suggested for this type of cases. There are few individuals who have not occasionally experienced a sudden change from opening to closure and reversely occurring in both nostrils, or more often alternating from one nostril to the other, without any apparent cause.

Inflammation of the nasal mucous membrane is another condition that is frequently responsible for obstruction. Functional disturbance may occur in a normal mucous membrane; more often it occurs in one that has undergone inflammatory changes. Clinically, a chronically inflamed mucous membrane is either hypertrophied or atrophied or without change in size, and it loses its moist pearl-pink color which is characteristic of a normal mucous membrane. The hypertrophy or hyperplasia may be a conservative process, one of nature's efforts to compensate for some loss of function or for some local anatomical irregularity. Thus, large turbinates are found in roomy noses and on the concave side of a deviated septum. No such utilitarian purpose is evident in an atrophic or otherwise chronically inflamed membrane. One cannot but feel that here the underlying cause is some general systemic disturbance, such as syphilis, gout, rheumatism, or intestinal intoxication. It may be, too, that a disturbed secretion of the ductless glands has some influence. The relation of the erectile tissue of the nose to the gonadal glands has long been noticed. The facies of those with atrophic rhinitis is not unlike those with a deficiency of the thyroid gland. The broad nose, dry skin, and its frequent occurrence in women all suggest this, as well as the fact that the condition is less often seen in patients with hyperthyroidism. In the acute cases of inflammation the individual immunity is an important element. A virulent Klebs-Loeffler bacillus may be innocuous to some, while a bit of innocent dust will in a susceptible person excite the most violent inflammatory paroxysm.

In the treatment of these forms of obstruction much can be accomplished by the correction of any general disturbance, which even a superficial examination will in most cases disclose. Changes in the diet, the prevention of autointoxication, the correction of hygienic errors, and the treatment of any indefinite gouty, rheumatic, glandular or syphilitic conditions do more good as a rule than local applications. In this connection may be mentioned the favorable action of laxatives, potassium iodide, and small doses of thyroid extract carefully administered. If the obstruction is suspected to be of an anaphylactic origin vaccine therapy and protein desensitization might be tried. [With great caution.—ED.] As for local treatment irrigation is the one most frequently employed. Nichol's nasal siphon is well suited for this purpose, acting as it does more by suction than by pressure. A solution of soda bicarbonate, a teaspoonful to a quart of water, is less irritating than normal saline. There are some nasal membranes on which water in any form acts unfavorably. In these cases an

oily preparation may be substituted. Menthol three grains, ichthyol thirty grains, and petrolatum one ounce, is a prescription that can be freely used and often repeated by patients. Intranasal operations are now undertaken reluctantly. Removal of a diseased tonsil by improving the general health relieves local symptoms. Turbinectomy has largely proved a failure. There are, of course, exceptions to this as to other rules, but the essential validity of this statement is apparent to all who have seen the passing of what was once a popular operation. Among the exceptions may be mentioned the removal of the hypertrophied portion of the interior turbinate, or of an enlarged posterior tip, which is still done occasionally.

Considerable attention is now paid to the appearance of the septum. Deviation of the septum, particularly if it is of traumatic origin and limited to the anterior portion, does prevent the air from passing through, and there are few operations where the good results are more striking. On the other hand, it must be noticed that some form of septal irregularity is almost a universal condition, and a perfectly straight septum is an anatomical exception. The curves and angles that one sees so frequently on the septum are usually normal and innocent variations occurring coincidentally with some other pathological condition.

Patients have a way of disappearing, and it is difficult to get accurate data regarding many submucous operations. Many of these subsequently show up again at a different clinic or office with the same complaint. The surgeon thus sees less of his own unsuccessful cases and more of those of his colleagues, unsuccessful as far as the functional result is concerned, although the appearance of the septum following such operation is all that could be desired and shows evidence of surgical skill. Many feel that a submucous resection is always a conservative operation because the original incision is small and the mucous membrane is not sacrificed. In the separation of the periosteum and in the removal of the bone and cartilage considerable trauma is done, which with the subsequent fibrosis often affects the mucous membrane unfavorably. Following the removal of the bone and cartilage there remains considerable redundant tissue which assumes somewhat its former position, and a deviation may persist after operation. Diagnosis of a deviated septum is easily made, but to determine its relative importance in the causation of the obstruction requires careful watching and good judgment.

Bacterial Vaccines — Chloretone Solution as a Vehicle for Their Administration.

OWEN, MARTIN, and BROSIUS, in the *Journal of Laboratory and Clinical Medicine* for October, 1920, state that in a recent article in that *Journal* (vol. v, p. 583) Aldrich and Ward discussed the use of chloretone (trichlortertiary butyl alcohol) and mentioned its anesthetic and bactericidal powers, stating that it would not only prevent the growth of molds, but would kill all but the most resistant spore-bearing germs. It also exerts marked local anesthetic effect with some hypnotic and general anesthetic action. In addition relatively large doses can be taken with impunity.

For several years they have been using a saturated solution of chloretone to wash their bacterial suspension off the agar slants and to dilute the bacterial mass to the proper number. After the desired dilution has been made the vaccine is heated in a water-bath at 55° to 60° C. for one hour and the usual control cultures made. The chloretone will, of itself, kill all the organisms present without heat, but may require several days to do so.

There is no clumping of the organisms as seen when trikresol or carbolic acid is added, and the resulting vaccine is perfectly homogenous, sterile, and remains so. Moreover, its anesthetic properties make

the use of such a vaccine most acceptable to the patient.

It is not necessary to sterilize the chloretone solution before use. They simply make up a saturated solution in cold distilled water, keep it for several days, and test to insure sterility. Once sterile it will remain so indefinitely.

Food Values in Tuberculosis.

Woodcock and Ruston, in the *Lancet* of October 23, 1920, in summarizing their article on this subject, state:

1. We find that tuberculous patients require more food than the average amount needed by the ordinary laborer outside. The minimum for Gateforth patients contains 3500 calories, the patients being almost invariably adults.

2. The diet must be rich in protein and fat—protein, 4 to 4½ ounces per head per day; fat, 4 ounces per head per day. We consider that the fat should be largely animal fat, particularly in the form of milk and milk products. If margarine is used it should be as oleomargarine and not made from vegetable fats.

3. Eggs should be in the dietary, and when they are not supplied their place should be taken by an extra amount of meat given according to accurate calculation.

4. Whole-meal bread, beans, peas, and lentils should always be used, together with a plentiful supply of fresh fruits and vegetables grown in the sanatorium grounds.

5. Two pints of milk per day is the amount they suggest for each patient.

Benzyl Alcohol for Toothache.

Macht, in the *Journal of the American Medical Association* of October 30, 1920, calls attention to what he believes to be a very satisfactory minor use of benzyl alcohol. He has found that benzyl alcohol either alone (100 per cent) or, still better, when mixed with an equal part by volume of chloroform furnishes a most efficient anodyne for toothache, when introduced on a pledget of cotton into a tooth cavity, or applied to an exposed nerve. The relief obtained by the use of such drops is marked and almost instantaneous, and is also long-lasting. He is not aware of any other drug, with the exception of cocaine, which is more efficient in relieving toothache. As benzyl alcohol is the least toxic of all the well-known local anesthetics, the repeated and free use of such a combination as described above is free from the objections which are raised by the employment of cocaine, and it can be administered with impunity even to small children. It is for this reason that he has deemed it worth while to publish this note in order to advise the medical practitioner of a simple remedy for the relief of one of the most excruciating forms of pain.

Symptoms Resembling Tabes Dorsalis Arising After Antityphoid Inoculation.

Bury, in the *Lancet* of October 23, 1920, states that there is ample evidence that the low percentage of cases of enteric fever in the British army during the recent war was due to systematic inoculation with antityphoid vaccine, and also that in the vast majority of cases such inoculation was quite harmless. Large doses of the vaccine are well tolerated by healthy persons, but this is not always the case in persons who have some morbid taint. The vaccine may light up a latent tuberculosis, may cause a rise of temperature, and a recrudescence of intestinal symptoms in persons who have suffered from enteritis, and may lead to the development of albuminuric retinitis in the subjects of Bright's disease.

Meyer has recorded a sudden death due to edema of the glottis after inoculation in a case of status lymphaticus. Very rarely symptoms of disease have been observed to develop in previously healthy persons soon after inoculation. The sequence, of course, may have been accidental, the ob-

served illness being due not to the vaccine, but to some other agent. A critical investigation of every case is essential, but even then it may be difficult or impossible to decide as to the cause of the illness. The absence of satisfactory proof, however, neither detracts from the interest of the association nor lessens the necessity for putting it on record.

Preoperative Catharsis.

In the *Journal-Lancet* for November, 1920, FANSLER says every one knows how bitterly some postoperative patients complain of gas pains and how even death may result from distention. Any one who has run the gamut of massage, eserin, pituitrin, stupes, enemas, etc., upon an already weak and exhausted patient is perfectly willing to dispense with this form of excitement. Distention of the intestines is due to several factors: first, the abnormal formation of gas, and secondly, the lack of peristaltic power. This relaxation and lack of normal peristalsis are due to several conditions—the opening of the abdomen and the manipulation of the contents, the complete relaxation due to the anesthetic, and the relaxation following the primary stimulation due to the cathartic.

In order to understand the increase of gas formation he outlines the normal process of digestion. The food is masticated in the mouth and mixed with the salivary secretion, which partially converts the starch into maltose and dextrin. In the stomach the fats are partially emulsified, but little absorbed. The proteins and albuminoids are partially digested and partially absorbed, as are also the starches. Most of the fats and a goodly portion of the proteids and starch are then passed on into the small intestine but partially digested. Here the pancreatic juice and bile, together with the secretion of the small intestine, practically complete the digestive process. The large intestines now receive the residue. In the large bowel there is little digestive secretion, and changes in the material passed into it are largely due to putrefactive processes, which affect chiefly proteids. We have then a general digestive process, each part of the digestive canal being prepared to receive the food after it has been properly acted on by that portion of the digestive tract just above.

Now, what happens when a cathartic is given? The food which is normally passed through the alimentary canal tract in twelve to twenty-four hours is rushed through the intestine in a much shorter time. The small intestine, instead of receiving a well-prepared food for its digestion, receives a food scarcely digested at all. In turn the large intestine, which ordinarily receives very little undigested residue, is insulted with a heterogeneous mass of undigested starch, proteids, and fats. What is the result of dumping such a mass of culture-material into a bacterially infected tube of optimum temperature? Naturally fermentation occurs, with the production of a large amount of gas, which the relaxed intestines pass with difficulty. So much for the general effects.

In rectal work there are certain local effects to be avoided, namely, the unnecessary soiling of the wound, postoperative hemorrhage, and pain. This is best accomplished by confining the bowels for three or four days following operation, thus allowing nature to build up her defenses against infection and to permit the sealing of the capillaries to become complete. This is certainly not well accomplished if the patient is constantly having to pass gas. The wounds are put on a stretch, thus encouraging bleeding. Fecal particles are carried down upon the freshly cut surfaces, all of which contribute to the patient's discomfort, if they do not actually menace the patient's life. Not infrequently the peristalsis and the straining required to pass the gas will also produce a bowel movement, which causes the same complications as flatus, only to a more marked degree.

Personally, he believes that the interest of the patient will be far better conserved if the cathartic is omitted or the patient is pre-

pared according to the following plan: Seventy-two hours before the operation the bowels are cleared with castor oil, for this allows time for the period of excessive gas-formation to pass before the time of operation. In other words, the alimentary tract is unloaded and allowed time to return to its normal condition minus its load of digesting material. Following the ingestion of the cathartic only liquids or food that will leave very little residue is permitted. The evening before the operation the patient is given a high enema of normal saline solution. It should be so given as thoroughly to clean out the lower bowel, for frequently a poorly given enema does not do so. The following morning, two hours before the operation, a copious low enema of warm saturated boric acid solution is given. This is the final preparation before the operation. After the operation the same diet is continued and 4 Cc. of tincture of camphorated opium is given every four hours. By this method the bowels may be confined for several days and undue gas-formation will not occur. At the proper time a saline cathartic and an enema of warm olive oil will insure a soft, easy bowel movement.

Vitamines.

The *Boston Medical and Surgical Journal* of October 28, 1920, in an editorial on this subject, says it has long been known that there were substances in food which are necessary to the development of human well-being which are apart from the heat-producing portions of caloric value of the food. These unknown substances are termed vitamines. Chemists and physiologists do not know exactly what these substances are any more than the physicists can tell what electricity is, but they know what the vitamines can do, or rather what will happen to the person who is deprived of them.

Three forms of vitamines are recognized. The first, the scurvy-preventing or antiscorbutic vitamine, has been recognized for a long time. Scurvy has been a well-known disease, especially in the time of the old sailing vessels. When Massachusetts was a seagoing community scurvy was common on shipboard, where it was impossible to provide fresh foods and vegetables for long voyages. It became known that lime juice, and fresh vegetables when possible, prevented scurvy or cured it when it had developed. Later, when artificial infant feeding was developed it was found that babies fed on carefully prepared, that is sterilized, milk often did not thrive and sometimes developed hemorrhages resembling old-fashioned scurvy. This condition of the baby, when recognized, was quickly overcome by giving the child orange or other fruit juice.

The vitamine preventing scurvy is known as the antiscorbutic vitamine. It is destroyed in food by heat and oxidization. It can be replaced and scurvy prevented by the administration of fresh orange, lime, or lemon juice; also tomato juice, either freshly prepared or from a newly opened can (for the heat alone does not seem to destroy the valuable vitamine of the tomato). Incidentally, tomatoes have present the two other forms of vitamines and so are specially valuable as a food constituent. This accounts for the great popularity of both fresh and canned tomatoes to-day in the diet of the community. Somehow or other the public has instinctively recognized the need of tomatoes to their well-being and adopted them as part of their diet. The laboratory has demonstrated scientifically the value of the tomato to every one as a palatable solution of all of the vitamines necessary for human well-being, thus giving its approval to the tomato's popularity as a food constituent.

These have been found in animal foods especially butter-fats. Hence they are found in whole-milk, cream, butter, and cream cheese. Lard alone of the animal fats seems to be deficient in this form of vitamine. The vegetable oils do not appear to carry this very necessary vitamine. It

is also found to be present in the yolks of eggs.

The fat-soluble vitamine is probably needed especially during the growing period of life. It is needed for the complete development of a perfect body. Although the action of this form of vitamine is less understood than either of the others, there is more evidence of likelihood of serious pathological results arising in every-day life from a shortage of fat-soluble vitamines than of the other vitamines.

Like the other two vitamines, the fat-soluble vitamine as a chemical entity is unknown. Recently it has been demonstrated that this fat-soluble vitamine has been found in certain plants such as spinach, tomatoes, and especially in yellow pigmented vegetables such as carrots, peas, sweet potatoes, yellow corn, etc.

The so-called water-soluble vitamines have to do largely, from a practical point of view, with the subtle thing called appetite. The loss of appetite is brought back by the presence of the necessary vitamines in the food, not simply by the increased injection of food or food flavors. That is to say, the vitamine must be present before the food can or will be taken and so utilized in the metabolism, or, in other words, used to build up the body tissues.

The water-soluble vitamine—the appetite-producing vitamine—has been refined out of our sugar, bolted flour, and polished rice; also from our refined oils and fats. It is not found in ordinary meat or fish. No great harm need result from this careful purification of foods which furnish the greater part of the calories used by the average American household, because other forms of food are generally added in sufficient quantities to supply the need for the necessary vitamines. Most people instinctively eat sufficient vitamine-containing foods because milk, eggs and kidneys and liver are animal foods rich in vitamines, and in addition most of the fruits and vegetables also contain the vitamines.

Fresh milk contains all three varieties of vitamines at present known. The vitamines of the fats are resistant to heat and are constantly present in eggs and milk, and the water-soluble vitamines are also able to withstand heat. On the other hand, the antiscorbutic vitamine is destroyed by raising milk slowly to a degree of heat necessary for pasteurization. Such milk rapidly loses its antiscorbutic vitamines.

It is known from many experiments that no animal can live upon a food which is a mixture of pure protein fats and carbohydrate, and even when the necessary inorganic salts are carefully added the animal still cannot flourish. The animal body is adjusted to subsist either upon plant tissues or the tissues of other animals, and these contain countless substances other than the pure protein starches, fats, and salts.

Three of these active substances have been recognized under the term vitamines: Antiscorbutic vitamines which prevent scurvy; fat-soluble vitamines which favor body growth; water-soluble vitamines which have to do with appetite.

The presence of all three vitamines is essential to bodily well-being, and even though the symptoms of complete vitamine starvation may not be present, nevertheless many vague symptoms of malnutrition often may be due to an insufficiency of vitamines in the diet.

The refined foods for the most part have lost their vitamines; thus our staple foods, such as flour, sugar, rice, macaroni, vegetable fats, lard, and plain meats, are much deficient in vitamines.

Fortunately a comparatively small amount of vitamine is all that is necessary to supply the requisite quantity for the body's development and well-being. All of the essential vitamines are to be found in fresh milk, eggs, coarse flours, most vegetables and fruits, especially tomatoes, oranges, grapefruit, lettuce, spinach, cabbage, cauliflower, and other leafy vegetables; also peas and beans and grapes and other fruits. There is, therefore, no need of worry about a deficiency of vitamines

when foods rich in vitamine are so easy to add to the ordinary dietary.

[Combined vitamines ready for use are now on the market under the name of Metagen.—ED.]

Influence of Dilution on the Toxicity of Alcohol.

The *British Medical Journal* of October 23, 1920, in an editorial on this subject states that Dr. H. M. Vernon, in 1919, in a study undertaken at the instance of the Central Control Board (Liquor Traffic), investigated the action of 5,- 10,- 20,- and 40-per-cent solutions of alcohol taken in the form of pure alcohol or brandy. The quantities of alcohol consumed were not greater than 30 Cc., and dilutions of less than 5 per cent were not employed. The ensuing impairment of neuromuscular coordination was measured by a typewriting test, or by the use of an adding machine, or by target pricking. Using the typewriting test, Dr. Vernon has conducted on himself a further series of experiments. Three and a half hours after food 15 to 90 Cc. of alcohol were taken; in the case of the larger doses the toxic effect was found to increase at a more and more rapid rate, the greater the quantity of alcohol taken; when drunk as 20-per-cent whisky, 18.3 Cc. of alcohol was followed by an increase of 0.8 in the "corrected" number of mistakes, 30 Cc. of alcohol by one of 3.4, 45 Cc. by one of 8.0, and 60 Cc. by one of 17.0. The findings of the former investigation are thus fortified. One of the inferences to be drawn from the more recent investigation is important, and—as a fact established by scientific experiment—new. The toxic effect of alcohol taken in considerable dilution was found to be much slighter than was anticipated, and Dr. Vernon concludes that, "practically speaking, beer containing 3 per cent by volume of alcohol, or 5.25 per cent of proof spirit, is a non-intoxicating liquid." When taken in the form of 3-per-cent beer, 90 Cc. of alcohol produced only as much effect as 54 Cc. in the form of 4-per-cent beer, as 46 Cc. in the form of 5-per-cent beer, and as 42 Cc. in the form of 20-per-cent whisky. The 90 Cc. of alcohol mentioned is contained in 5¼ pints of 3-per-cent beer, and Dr. Vernon calculates that in his own case more than ten pints of beer, which would take him over four hours to drink, would be needed in order to intoxicate. It may be argued that experiments conducted on one person only are open to fallacy; the subject of these experiments conducted on another person eralization that 3-per-cent beer is non-intoxicating by comparative observations which show him to be more susceptible to alcohol than the average man. One set of experiments conducted on another person somewhat less susceptible to alcohol than Dr. Vernon is described; in this subject 65 Cc. of alcohol in 4-per-cent strength had the same effect as that produced by about 49 Cc. of alcohol in 10-per-cent strength.

Dr. Vernon shows the following practical conclusions from his experiments: "In order to bring about an increase of sobriety in the nation, it is clear that so far as possible the consumption of the stronger beers and of spirits ought to be discouraged, and that of the weaker beers and of cider to be stimulated. This object could to some extent be achieved by exaggerating the system of taxation which is already in force. If the taxation of light beer containing 3 per cent or less of alcohol were so reduced that it was possible to sell it at twopence per pint, whilst that of the heavier beers was increased so that beer of 4-per-cent alcoholic strength cost fivepence per pint, and beer of 5-per-cent alcoholic strength one shilling per pint, a very powerful stimulus to the sale of the light beer would be provided. For each penny spent a man would get 8.5 Cc. of alcohol in the form of 3-per-cent beer, 4.5 Cc. in the form of 4-per-cent beer, and only 2.4 Cc. in the form of 5-per-cent beer. Hence from motives of economy he would generally choose the 3-per-cent beer. He might grumble that it was not strong enough to tickle his palate, and occasionally indulge in the heavier

beers, but he would seldom be able to afford enough of these beers to bring him anywhere near to intoxicatiton."

The two beers with which Dr. Vernon experimented contained, before dilution, 5.43 per cent and 3.46 per cent of alcohol by volume. Dr. Vernon found that light claret containing 10 per cent of alcohol, taken with the food, had a slight toxic action comparable with that of 3-per-cent beer taken on an empty stomach; port or sherry imbibed under similar conditions would, as a rule, be rather more toxic than 5-per-cent beer taken on an empty stomach. Claret had the same effect as whisky diluted to an equal alcoholic strengtth.

Sinusitis in Children.

PHELPS, in the *Journal-Lancet* for November, 1920, states that a diseased sinus may produce local symptoms, or it may act as a focus but produce general symptoms. Every child with meningeal symptoms, an anemia, increase of temperature of unknown origin, or with asthma or nephritis, pyelitis, arthritis, endocarditis, headaches, or long-standing colds, bronchitis, indefinite gastrointestinal symptoms or cyclic vomiting, should be very carefully examined for sinusitis. The most frequent local symptoms are nasal discharge and headache. If it can be established that the headache decreases when the discharge begins, or the headache is worse in the morning or on bending the head forward, it is suggestive of sinusitis. None of his cases complained of severe headache except those with a meningeal lesion. Usually the ache is not frequent nor common. Any child with a known sinusitis in which the headache does not improve on treatment should be watched carefully for signs of meningeal involvement. Sneezing is said to be a common symptom. Tenderness over the sinus, swelling of the eyelids or cheeks, and fistula in the upper or lower lid are suspicious signs of sinusitis. Two of Phelps's cases had a swelling of the forehead between the eyes, which was soft and not tender, yet was a subperiosteal abscess from a perforating sinus infection.

The rôle of the sinuses as a focus of infection is not so well established in pediatrics as it is in general medicine. More attention should be paid to this relationship, which will require a greater coöperation between the pediatrician and the rhinologist. In this connection Dean has shown that cultures from the sinus which acts as a focus usually show hemolytic streptococci.

Frequent colds was the complaint in 19 cases, most of which were maxillary infections.

Bronchitis occurred in eight cases, and was relieved in all by treatment of the sinuses.

Otitis media was present in five cases; three were cured, and their history extends over several years. The other two required mastoidectomies.

Nephritis in an acute form was present in one case, which cleared up after a sinus operation.

Bronchial asthma in two cases, both maxillary infections, and in both immediate relief followed the treatment of the sinusitis, but the relief was not permanent. He found no recurrence of the sinus infection, however.

Eye complications—3 orbital abscesses, 2 orbital cellulitis with no pus found, on operation or post mortem. Five swelling of the eyelids and one abscess of the lower lid are in this group. Most of these complications were the first symptoms of the sinus disease.

Intracranial complications occur in children more often than is usually considered, for the average case of meningitis is never examined for a sinus infection.

Palliative treatment is successful in the majority of cases when it is directed toward establishing drainage and ventilation. The use of oily and alkaline sprays, inhalations and nasal irrigations, together with suction and a weak adrenalin solution, will often relieve the condition better than an operation. Vaccines are used by some with success.

Should these measures fail the drainage should be increased by removing the obstruction, being careful to destroy as little nasal tissue as possible. The tonsils and adenoids may be removed, and the anterior tip of the middle turbinate trimmed, but never removing the entire turbinate. These measures, like those above, are directed toward producing drainage through the natural orifices and should be tried whenever there is a reasonable chance of success.

In certain fulminating types and in cases not relieved by other methods a radical operation is indicated. This operation is the same as is done in adults, except that no external operation should be done on the antrum on account of interfering with the development of the teeth.

Chronic sinusitis occurs in children quite frequently and may act as a focus of infection.

The *x*-ray is the best method of diagnosing a sinus infection.

Most cases recover without any radical operation being performed.

The Feeding of Normal Infants.

McLEAN, in the *Medical Record* of November 6, 1920, considers the different articles of food constituting a more liberal diet for an artificially fed infant and the reasons for their use.

In most instances it is well to begin the administration of orange juice as early as three months; one may commence with one teaspoonful daily one-half hour before the second morning bottle. This daily amount may be increased by one teaspoonful each week. At five to six months of age the infant will be receiving the juice of one orange daily, or approximately 2½ ounces. The liberal use of orange juice minimizes the necessity for laxatives so often used in the artificially fed baby to correct constipation. Almost all the milk fed to infants in New York City is pasteurized. Scurvy has frequently been noted in infants fed exclusively on pasteurized milk. Orange juice is one of the richest sources of antiscorbutic vitamine; if begun in small doses and gradually increased, it seems to be well tolerated. Infants six weeks of age have been seen who were given orange juice as a laxative without ill effects.

At the age of nine to twelve months orange juice may be replaced by well-strained apple sauce or prune pulp. These substances add more bulk, are more laxative, and have a greater caloric value than orange juice.

The average artificially fed infant, in the experience of many, thrives better after the sixth month with at least part of his caloric needs supplied by other food than milk. The amount of other food may be increased as age advances. As a rule not more than twenty-eight ounces of milk per day is given, and after the tenth month this amount may be gradually decreased. By the eighteenth month he will usually not need more than twenty to twenty-four ounces per day.

Why is it that an exclusive milk diet for an infant up to twelve months of age is undesirable? Chiefly because of the small amount of iron plus the objection to the large amount of bulk necessary to give the infant sufficient calories. It is probably because cow's milk is low in iron that infants become anemic. Every infant is born with an "iron reserve." If he is breast-fed he utilizes the iron present in the mother's milk and apparently maintains a normal balance. The iron reserve plus the amount he receives from the cow's milk may carry him along a varying number of months until he finally becomes anemic. This frequently begins to be noticeable from the eighth to the tenth month, and becomes more marked as age advances. At that age or earlier he needs a supply of iron from some other source. A sufficient addition cannot be furnished by increasing his supply of milk.

The feeding of cereals may be advantageously begun about the fifth month, generally in the form of strained oatmeal jelly. Oatmeal has much residue to furnish bulk and helps constipation. If begun in small amounts (a teaspoonful daily given just before the second morning bottle) it

may be increased at regular intervals so that by the tenth month the infant is receiving two or three level tablespoons twice a day. Infants vary in their ability to handle starch, but the majority assimilate these amounts without difficulty. Some infants under three months of age with a stationary weight have begun to increase in weight upon the addition of raw starch in the form of barley flour. Infants have been encountered who were doing well on a milk mixture in which the carbohydrate was furnished (through a mistake in interpreting directions) in the form of 50 grammes of raw starch per day.

Morse does not advise the use of eggs before the eighteenth month; he then gives one-half of an egg once or twice a week and gradually increases the amount. It has been frequently noted in feeding infants that it is the egg-albumen which is difficult for the infant to digest. For this reason the administration of egg is begun by using only the yolk, which is high in iron and in fat-soluble vitamine and is not difficult to digest. It may be begun about the sixth month with one-eighth to one-fourth of the pulverized yolk of an egg which has been boiled 20 minutes. This is mixed with the vegetable or cereal, and the amount is increased each week until the child is having the whole yolk of a hard-boiled egg daily. By the eleventh month he may be given part of a whole coddled egg, and if it is well tolerated, as it frequently is, he is given the whole egg, generally by the twelfth month. Pulverized egg-yolk may often be given as early as the fifth month without causing digestive disturbance.

The ever present question is: Is the simple diet sufficiently nutritious? It is beginning to be appreciated that to furnish a properly balanced ration for a normal infant over six months of age is not so easy as it was formerly considered. Little is yet known of the vitamine factor, yet certain facts have been established. Uncooked food has certain antiscorbutic properties not possessed by cooked foods, orange juice has more of these properties than milk, and the drying of milk deprives it of some of its antiscorbutic properties. Pasteurization also impairs the vitamines, and it has been recently shown that scalding milk is less destructive to the vitamines than boiling for five minutes.

Simple Every-day Science About Yeast.

HIRSHBERG, in the *Medical Record* of October 30, 1920, says obviously the dirty, ugly looking, huge hunks of yeast sold in many shops do not measure up to the necessary, scrupulous cleanliness which is required to avoid the chance of contamination. Yeast, like milk, ought to be certified as to its freedom from germs. It is a complete food, as easily polluted as fresh milk. Unless one can assure oneself that the yeast one eats before each meal and in his bread is made in tanks, pipes, and presses that can be and are sterilized with live steam, one may defeat the great good which pure fresh yeast will generally accomplish.

The small square of yeast which one ought to eat before meals ought to be kept in your grocer's or baker's refrigerator, fresh, firm, effective, active, and with its vigor and growth unimpaired. This is all accomplished, if delivered in its fresh state each day, iced and refrigerated. The long cakes—resembling but larger than bricks of ice cream—are easily sliced with wires into small cakes and wrapped in tin-foil.

The dietetic and health value of yeast has been discovered in recent years, not by careless observers but by some of the most eminent, painstaking, diligent, unprejudiced research workers in the world. Each more or less without the help of the other has found that half a yeast cake a day aids the health, growth, vitality, weight, repair powers, and personal beauty of those who eat it regularly.

Among the unbiased investigations which have brought this to light are such places as Yale University, Rockefeller Institute, Columbia, Jefferson Medical College, Fordham, Johns Hopkins, Minnesota Experiment Station, and the U. S. Government. The investigators themselves are Casimur Funk, the discoverer of vitamines; Os-

borne, Mendel, Levene, McCaskey, Hawk, Bergheim, and many others. They have proved that yeast is, like milk and honey, a complete food in itself. It also contains vitamines. It relieves constipation. It adds weight and growth. It helps the red and white blood corpuscles to digest and to destroy the pathogenic germs causing pimples, boils, and other more serious skin troubles as well as those which are mere blemishes.

For infants, yeast is a pabulum superior to all but pure milk, and a great adjunct to boiled and pasteurized milk as a remedy and preventive of scurvy, rickets, backwardness of growth, flabbiness, obesity, and other maladies. Moreover, in adults it helps to ward off beriberi, pellagra, constipation, hemorrhages, certain joint pains from sugar disorders, the deformities of rickets, gout, and other digestive and deficiency diseases.

The Endocrines in Gynecology.

In the *New York Medical Journal* of November 6, 1920, GRAVES states that in the light of theoretical, experimental, and anatomical knowledge, combined with long-continued observations, our general estimate of the ovary as a gland of internal secretion may be briefly summarized as follows:

1. For complete somatic growth and sexual development the normal secretion of the ovary is essential. To what extent the action of the secretion is direct and how far it serves as a balance to other more powerful secretory influences are matters of speculation.

2. During menstrual life, and especially during the years of adolescence, the proper functioning of the ovaries has a very important bearing on the physical and mental character of the individual.

3. Dysfunctions of the ovaries are usually attended with various neuroses. Some of these may be due to the direct disharmonious action of other endocrines, especially those that have an affinity for the autonomic nervous system. In evaluating these neuroses one must also take into account those neurotic habits which are the result of a sense of physical inferiority, and characterized as a continued endocrinous emotional state.

4. In the adult the ovarian secretion plays a somewhat minor rôle in the human economy, as is indicated by the comparatively slight physical changes that take place after ablation or the natural menopause. This has an important bearing on the question of removing the ovaries during hysterectomy.

5. During adult life the most definite evidence of the existence of a true internal secretion from the ovaries is the occurrence of hot flushes and genital atrophy after ablation. These symptoms point to a balancing rather than a direct action of the ovarian secretion.

6. From an organotherapeutic viewpoint, the ovary must be regarded as primarily a homogeneous gland, the essential secreting structure being the interstitial cells. Variations in secretions of different parts of the gland are probably differences of degree rather than of kind. A selective action of the secretion from different parts of the gland is not yet proved, and if it exists is probably quantitative.

7. The therapeutic value of ovarian preparations in Graves's experience may be stated somewhat as follows: All the ovarian preparations exert a specific influence on hot flushes. In this respect the residue is the most intensive, but the difference in efficacy of the various preparations depends to some extent on the idiosyncrasy of the patient.

In the treatment of menstrual irregularities ovarian extracts exhibit an undoubted specific action, but this action is inconstant. In temporary functional amenorrhea, delayed menses, dribbling before and after catamenia, and small clotting, ovarian therapy is fairly reliable, and is at least the best asset that the gynecologist at present possesses for these symptoms. Theoretically for these affections the ovarian action may be enhanced by the addition of thyroid and

pituitary extracts, but of this his personal clinical experience has not been entirely convincing.

For the permanent amenorrheas, especially those associated with pluriglandular disturbances, ovarian therapy has little or no effect on restoring the menstrual function, but is of undoubted value in improving the patient's general health. It is best in these cases to administer the ovarian treatment in considerable doses, separately from the other gland extracts.

In certain types of dysmenorrhea ovarian feeding is efficacious, occasionally brilliantly so, but it is unreliable and often disappointing after giving early promise. In the severe types of dysmenorrhea it is of comparatively little help. For menorrhagia and metrorrhagia ovarian therapy is not indicated.

Arteriosclerosis.

In the *Medical Record* of November 6, 1920, NAMMACK, in referring to the treatment, says it is manifest that there is no routine plan of procedure for an essentially chronic progressive disease like arteriosclerosis. The key-note is individualization, study of the patient with the disease. This cannot be learned from reading text-books or journal articles, nor even taught at bedside clinics. Teachers can only teach what they are, not what they know. Our old friends, General Principles, can be given in the way of advice, by way of prophylaxis, provided we catch the patient early enough in life. After that it will depend on our personal influence over the patient, and his own stability of character, whether we can correct the injurious influence of his environment. Every man is more or less the arbiter of his own fate. The one essential in the diet for a patient is reduction in the amount. Americans eat too much, as a rule, but those who have traveled in German and Scandinavian countries will admit that by comparison we are abstemious, if not penurious, eaters. Meat has been so abundant in this country that few meals are considered complete without an abundance of meat and sweets. Herbert Hoover deserves the everlasting thanks of this generation, even though he be denied their votes. A diet of vegetables, fruit, fish, bread and butter, and milk, with very little meat, will suffice in most cases. The supposed injurious effects of the lime salts in milk can be avoided by the addition of lime water, which precipitates the soluble lime salts in the stomach, and facilitates their excretion by the intestines rather than by the kidneys. Buttermilk, either from the churn or from the Bacillus acidus lacticus, may furnish an agreeable substitute for sweet milk. Balneotherapy demands careful individualization also. Our generation is certainly a bathing one, but it is folly to encourage the morning cold bath to those who do not react glowingly after it, and criminal to advise the Turkish or Russian bath to one with degenerated cranial arteries.

The one drug to which we turn, for the prescription which most patients expect in return for the fee, is iodide of potassium. Its action has been the result of much controversy. Some writers believe that it acts as a vasodilator and thus decreases blood-pressure; others that it lessens the viscosity of the blood. Capps denies that it does either and says that its only benefit is selective absorption of the cellular exudate in syphilitic arteritis. Lemoine believes that iodide of potassium is a therapeutic heresy. Hood states that it is now generally conceded that iodides and iodine have no place in the treatment of hypertension or arterial fibrosis. Nammack's own hypothesis is that salt-poor and salt-free diet should be pushed to the point of removal of the surplus sodium chloride from the body, and to keeping the tissue sodium chloride content at the physiological amount. To help to accomplish this he advocates administering one-per-cent solution of potassium nitrate, of which fifteen drops are to be taken three times a day in half a glass of water until the individual is filtered of his excess chlorides.

Long before the endocrinists held their present sway, it was believed that the thy-

roid secretion and that of the adrenals were antagonistic, and small doses of thyroid extract, half a grain twice a day, were given with benefit to reduce hypertension. But it is not always wise to reduce hypertension. It is perhaps fortunate that our well-meant efforts to accomplish reduction do not always succeed. Nitroglycerin will usually fail, as it is eliminated in about thirty minutes. Sodium nitrite will hold a slight effect for about two hours. There is no question about the efficacy of amyl nitrite in anginal attacks, and many elderly patients are profuse in their verbal expressions of gratitude for its presence at their bedsides at night, or in convenient vest-pocket pearls by day.

Benzyl benzoate has recently been lauded by Macht in angina, and in other spasmodic seizures. He (Nammack) would put tincture of aconite into the hands of a careful nurse, or hospital interne, for use in excessive hypertension, but would want the effects carefully watched, and the results checked by the sphygmomanometer. But the greatest good is done for the patients in Bellevue and St. Vincent's by absolute rest in bed. Karell diet for four days, hot packs, and free purgation, with venesection added in uremic convulsions or coma. Morphine is sometimes invaluable to secure rest at night, but it should never be forgotten that morphine checks all the secretions but one, and that the habitual use of morphine is the beginning of the end. Influenced by the teachings of the late George L. Peabody in the New York Hospital, he has made an extensive trial of amylene hydrate in hot milk at bedtime. Some patients swear by it, many others swear at it. It can be given by rectum when the stomach is intolerant. The Trunecek serum has gone the way of all fads.

The treatment of the latter stages of arteriosclerosis becomes that of the damage done in brain, heart, kidneys, or intestines, and opens up too wide a field to be covered in this discussion. Prevention, by recognizing the disease in its early stages, must after all be our watchword.

Practical Therapeutics in Dermatology.

HAMMOND, in the *Journal of the Missouri State Medical Association* for November, 1920, leaving the most important consideration, that of internal treatment, until last, cites some hypothetical cases and endeavors to apply his more or less routine practical therapeutics.

A case of infantile eczema of the scalp; of the crusted, pustular type. He begins with the following ointment:

> Red sulphide of mercury, gr. xv;
> Sublimated sulphur, ʒvj.
> Oil of bergamot, gtts. xv;
> Vaselin, ʒiij.

This is spread on very thin layers of cotton, and applied to the scalp morning and night. Every other day the affected area is thoroughly cleansed with olive or sweet oil. In the course of a few days suppuration ceases; the active process subsides, and the lesions become dry. The application is then made once daily. When only superficial scales remain, the following salve is used sparingly, with or without covering:

> Acid salicylic, gr. xv;
> Tr. benzoin, gtts. xl;
> Vaselin, ʒjss.

Here we have a method which he says should be curative in 75 per cent of cases of this type. There are several little refinements of detail which must not be overlooked. The ointment should be applied on cotton, never with cloth or gauze. This holds good, of course, wherever a salve is used. It is surprising how generally this detail is overlooked. The cotton should be pulled off the roll in as thin layers as will hold together, to avoid undue heating, and the salve spread on it evenly with a table knife. Instead of using bunglesome bandages, a snug helmet can be made from very thin cambric.

Scratching is most readily prevented by the old pillowslip method. A small slip is slit at one end and an opening made at the other, just large enough to allow the head to emerge. Several large safety-pins are placed between the arms and body, and the arrangement is complete.

Unfortunately, the internal treatment of

these cases, as of most skin conditions, cannot be so simply and graphically presented. We are confronted by the vast and intricate problem of milk modification and infant feeding.

There are, however, three or four expedients of the simplest nature which may be tried, and in a goodly percentage of the cases with very gratifying results.

The greater number of these children are overfed. A reduction of the diet of from one-fourth to one-third the total amount alone may turn the trick. Often one-half grain of calomel administered in a single dose every other night to babies of from six months to one year acts almost as a specific. A small dose of one of the potassium salts, either in solution or as supplied in some of the baby foods on the market, is a valuable remedy. When the children are undernourished one of the simplest and best additions to the diet is one or two tablesponfuls three times a day of a gruel made from whole rolled or crushed wheat which has been thoroughly cooked and mashed through a fine sieve.

One of the most intractable though apparently trivial conditions met with on the face is the deep vertical fissure which sometimes occurs in the center of the lower lip. He has known these fissures to persist for many months and to present an aspect very similar to that of a beginning epithelioma.

Ordinary applications are quite often without avail. The immobilization of the part with a narrow strip of adhesive plaster usually accomplishes a cure in a few days. The constant application of an ointment containing phenol, calamine, zinc oxide, and cold cream under the plaster is a useful adjunct.

Turning to a manifestation of the same disease of much greater magnitude, he considers a general, acute, erythematous eczema of a highly aggravated type.

Here, obviously, the local treatment would be of secondary importance. It is surprising, however, how many sufferers present themselves who have been endeavoring to alleviate their discomfort by coating themselves with vast quantities of salves and lotions.

The first step toward relief must be prompt and vigorous elimination. Nine times out of ten a saline has already been taken, and as often without result. A capsule containing 5 grains each of blue mass and compound extract of colocynth, with 1 grain of powdered ipecac, at night, and repeated the second night after, will be far more effectual.

When there is pronounced digestive disturbance a rhubarb and soda mixture should be given. The usual formula employed is:

Pulv. rhei, ℥j;
Pulv. ipecac, gr. x;
Sod. bicarbonate, ℥iv;
Aq. menth. pip., ad ℥iv.

To this it is the custom to add an ounce of potassium acetate, to increase the alkalinizing effects of the soda.

In the other cases where digestion seems unimpaired, and especially in plethoric individuals of excess weight and high blood-pressure, aconite seems to do a great deal of good. It is combined usually as follows:

Potassium acetate, ℥j;
Tr. nux vom., f℥iv;
Tr. aconite, f℥vj;
Fl. ext. rumicis rad., q. s. ad ℥iv.

This would seem to be an excessive amount of aconite, but no disturbing symptoms have been observed with it used in this combination.

In addition to chloral, hyoscyamus and cannabis indica, used as general sedatives to allay itching, especially at night, or a pill of atropine and pilocarpine, seems in a great many instances to work wonders. Instead of experimenting with the rest he starts with the atropine and pilocarpine pill, 1/100 of a grain of the former with ¼ grain of the other, one pill being given at bedtime, and a second, if necessary, an hour or so later.

It may be objected that these two drugs are directly opposed to one another in their physiologic action. The fact remains, however, that together they will accomplish what neither one will separately; and the unpleasant effects of both are offset in the combination.

The Use of Benzyl-Benzoate in Seasickness.

In the *California State Journal of Medicine* for November, 1920, GLENN states that the efficiency of benzyl-benzoate in the relief of spasms of the smooth muscle tissues has been amply confirmed. Many of us have seen marked relief follow the administration of this drug in dysmenorrhea, cardiospasm, pylorospasm, pain in gastric ulcer, and in certain forms of asthma. Hiccoughs yield to its use, and recently Macht has reported good results following its use in whooping-cough.

The striking results obtained in the above conditions led the writer to suggest the use of benzyl-benzoate in seasickness.

An opportunity to try out this drug in seasickness came when his secretary decided to take a boat trip from Los Angeles to Seattle. At his suggestion she took some benzyl-benzoate along.

Soon after leaving Los Angeles harbor she became ill, took ten drops of benzyl-benzoate and received almost instant relief. At night, when she returned to her room, she found the woman in the upper berth violently ill. She was given ten drops of the drug, and almost at once the groans and vomiting ceased. The woman was so still during the night that his secretary was afraid that she had killed her, and was greatly relieved when she awoke the next morning to find the woman perfectly happy.

A telephone operator desired to go to Catalina for her vacation, but feared the trip as she had always been seasick when riding on a steamer. At his suggestion she took benzyl-benzoate along. She became ill soon after leaving the harbor and took ten drops of the drug. Her symptoms disappeared very rapidly, and she enjoyed a sea voyage for the first time in her life.

The author's wife was attacked with seasickness soon after leaving Catalina. She was so ill that it was with difficulty she could swallow ten drops of the benzyl-benzoate in water. The effect, however, was immediate. The desire to vomit disappeared and she was able to enjoy the remainder of the voyage. Several others who had been attacked with seasickness on the ship were given ten drops of the drug with instant relief.

While the number of cases in which benzyl-benzoate has been used in seasickness at his suggestion has been small, about twenty in all, the result in every case in which it has been used has been so satisfactory that Glenn feels justified in recommending the use of this drug in all cases of seasickness.

In his cases ten drops of the drug were used, a small dose. One-half to a teaspoonful can be given with safety. As the sea voyage was short in all cases, he was not able to determine how long the effect of the drug will last. The results in his cases have been uniformly good and warrant a further study of the effects of benzyl-benzoate in seasickness. It may be that in benzyl-benzoate we have a drug that will make many a seasick victim happy.

Recent Advances in Obstetrical Practice.

POLAK, in the *New York Medical Journal* of November 13, 1920, states that while it has been contended by those who are making routine vaginal examinations that it is safe under proper precautions to enter the vagina at will, or at least as freely as is necessary to follow the advance of labor, his experience has shown that not only the morbidity but the mortality has actually been reduced by the adoption of routine rectal examinations. The vulva and vagina are the constant habitat of bacterial flora which are readily carried into the uterus by vaginal examinations. This can be absolutely prevented by confining explorations to the rectum. One can follow the course of labor by rectal touch after very little experience, and determine the dilatation of the cervix, the descent of the head, the rotation of the vertex, with almost as much accuracy as by vaginal feel. Only when the progress of labor has become arrested is it his custom to make a vaginal examination. When this is necessary it should be made a surgical procedure. The patient's vulva is clipped, scrubbed, and sterilized. The ex-

amining hand is scrubbed and gloved, and with the patient under an anesthetic a careful examination is made and the cause of the dystocia determined. Besides this, an accurate knowledge of the physiological processes of labor is essential, for labor is a mechanical process.

In the ordinary obstetrical case when the woman falls into labor, if she is a primipara and there is no disproportion, the head should be in the pelvis; while in the multipara, during the stage of dilatation, or shortly after dilatation is complete, the head either engages in the pelvis or it does not. This is fundamental. It would engage if it could, and if it does not there is some defect in the power, the passage, or the passenger. Consequently every labor must be studied and conducted by our knowledge of the presentation, position and posture, the preservation of the membranes, the maintenance of absolute asepsis, and the conservation of the nervous energy of the patient by rest.

Should intervention be demanded in the interest of mother or child, such operation can be done with the greatest margin of safety. Anodynes and analgesics are absolutely necessary for the patient's comfort in every prolonged labor; for certain mechanical processes must be effected in order that the child may pass through the pelvis, and these take time and require active labor pains; and pain exhausts. The steps of the mechanism occur after there is dilatation of the cervix and the presenting part passes the brim and reaches the pelvic floor; this in turn is followed by dilatation of the vulvar outlet. When the head passes out of the cervix, the uterus molds itself about the child, and this interferes with the uteroplacental circulation, hence the importance of an accurate record of the fetal heart, its action under the influence of uterine contraction, and its reaction during the periods of uterine rest, are essential in order to estimate the effect of labor on the child.

With this knowledge, should the necessity for operative intervention arise, the woman is reasonably safe, for the child is in good condition, the woman's strength is not exhausted, infection has been minimized, and sufficient time has been given to accomplish the opening up of the soft parts by nature's processes, consequently it may be deduced that every obstetrical case, unless the delivery is spontaneous, will fall into one of two general classes, namely, either the child will come into the pelvis, and providing the outlet is ample, allow of infravaginal delivery, or it will fail to enter the pelvis, when supravaginal delivery will be necessary.

In the first class, where infravaginal delivery is possible, certain essentials must be observed in order to have a favorable outcome. First of all, the cervix must be fully dilated, and this takes time; to give this time to the patient and yet conserve her nervous energy requires the use of anodynes. Here morphine and scopolamine used judiciously have given the greatest comfort to the woman, and have accomplished much which could not have been done without their aid.

Secondly, the membranes should be preserved until complete cervical canalization has been accomplished. The patient's comfort may be further advanced by keeping both bladder and rectum empty. A tight abdominal binder aids materially in crowding the head into the pelvis besides maintaining flexion, and it further maintains a better driving axis for the force of the pain. Not until the head has reached the spines or has passed them should forceps be resorted to, for in good practice to-day median and high forceps are seldom if ever used. Both of these procedures have a high fetal mortality. On the other hand, low forceps is a life-saving operation, and should be frequently employed, more frequently, perhaps, than at present, when the head is at the spines or below them and the cervix is fully dilated, and the outlet is ample; for many children lose their lives after they have reached the pelvic floor by too long delay in the perineal stage. Furthermore, the fascial sheets become overstretched and pelvic relaxation follows. Both Pomeroy and DeLee have called attention to this and have suggested prophy-

lactic forceps and perineal section in the interest of the child. The perineal section may be done through the median raphe or laterally, and so remove the soft part dystocia which is jeopardizing the fetal life.

Probably no advance in obstetrics has been so great as the recognition of danger to the child by routine auscultation of the fetal heart, done at regular intervals throughout the entire perineal stage. This means we are able to recognize cord complications, as coils, short cord, and shoulder cord, by the arrhythmias and souffles, and to terminate labor promptly in the interest of the child. Only in funnel pelves where the outlet is contracted, namely, when the bi-ischial and posterior sagittal diameters total less than fifteen, is infrapelvic delivery of the engaged head by forceps absolutely contraindicated. It is here, with a contracted outlet, with the head well in the pelvis, at or below the spines, and a living child, that pubiotomy has its principal indication. Hebosteotomy is also permissible in occipitoposterior positions of the vertex arrested at the pelvic outlet by contracted hard parts.

Differential Diagnosis Between Disorders of the Pelvic Organs in Women and of the Abdominal Viscera.

MONTGOMERY, in the *New York Medical Journal* of November 13, 1920, states that pregnancy often affords a cause for error in diagnosis of appendicitis. If a tumor is a fibroid, a subperitoneal one, as the uterus increases in size such a tumor may be squeezed between the developing uterus and the bony pelvis or abdominal wall, and the pressure thus induced leads to its being pressed into the uterine wall like a cork in a bottle until its circulation is cut off and it begins to set up inflammation as a foreign body. The pain, tenderness and muscular rigidity frequently lead to the diagnosis of appendicitis. He has seen three such patients, two of whom were subjected to operation for supposed appendicitis. In the third case, recognizing the condition, he attempted to carry the patient along by pushing up the uterus to release the pressure, but the condition caused an abortion, and the local state had become so disturbing as to later require an abdominal hysterectomy.

Ordinarily in acute appendicitis complicating pregnancy, the cecum generally being somewhat fixed, the gravid uterus lies in front of it, and consequently the pain may be aggravated by making pressure over the uterus or in pushing behind the uterus. In a fibroid causing the condition the pressure and pain are more anterior to the position of the appendix.

Treatment of Displacement of the Uterus.

BLAND, in the *New York Medical Journal* of November 6, 1920, in summarizing his paper on this subject, writes as follows:

1. Therapeutically there is a distinct need for a specific line of division between medical and surgical malpositions.

2. The symptomatology of uterine displacements, in general, as taught to-day is erroneous. This is confirmed by the small percentage of so-called cures following operation.

3. Uncomplicated malpositions should be treated by medical and mechanical means. Operative measures should be applied to those associated with distinct surgical complications.

4. Operative intervention should not be utilized in the simple malpositions of virgins or young married women.

5. The infantile uterus never requires nor is the condition benefited by surgery. Endocrine dysfunction as an etiological factor should be remembered. This condition should be treated and not the uterus.

6. Nerve and muscle relaxation (backache) should be regarded as a causative factor and not the result of uterine malposition.

7. Restoration of nerve and muscle power should be done in all cases, and

is best accomplished by rest and generous feeding.

8. In no case of retroflexion or retroversion will the patient recover in the presence of obstinate constipation or bladder overdistention. Overcome constipation, and malpositions will largely disappear.

9. The prolapsus of old women with low surgical resistance is best treated mechanically by the Menge pessary.

Removal of Adenoids in Infancy.

Tod, in *The Practitioner* for November, 1920, states when removing adenoids under the age of six months, especially if the baby be undersized or ill-developed, a general anesthetic is neither required nor advisable. The infant is held in a sitting position by a nurse, a small curette is passed up behind the soft palate into the postnasal space and brought down with one sweep.

Owing to the small size of the postnasal space, it requires but a tiny pad of adenoids to give rise to symptoms, but in some cases one is surprised at the amount of adenoids removed. As a rule, very little bleeding takes place, and there is rarely any shock, but the infant should be kept warm, and if there appears to be any shock, should be given a drop or two of brandy in a little milk.

It is advisable not to feed the infant for three hours before the operation takes place, so that it can be given the breast or bottle within ten minutes or so after the operation has taken place.

He has frequently performed this operation on infants, the youngest of which was but three weeks old, and he has never observed any harmful results in consequence. On the contrary, almost immediate benefit will be noted, as the child soon begins to breathe normally through the nose and to suck with comfort; otorrhea and bronchial symptoms, if present, rapidly disappear, and the weakly infant thrives and becomes strong.

For these reasons he strongly urges that adenoids should be removed, no matter how young the infant may be, whenever they give rise to any symptoms which may adversely affect its immediate or future welfare.

The Placental Gland and Placental Extract.

In the *New York Medical Journal* of November 13, 1920, Bandler states that the great and complex metabolic changes of the body in its normal state yield to important metabolic alterations in the pregnant individual, and without attempting to solve or even explain the intricate processes which have yet to be discovered, we are therapeutically depending more and more on our conception of endocrine aberrations to aid in the solution; and as the thyroid gland is, to his mind, one of the important protecting organs, especially over the renal epithelium, it is only necessary to conceive of a myxedematous change in the renal epithelium and in altered kidney function produced by the posterior pituitary, to furnish ourselves with at least an outline of some of the changes occurring in the so-called pregnancy kidney. A like change in the cell membrane of Gley would serve to explain many of the cerebrospinal symptoms in the pre-eclamptic and eclamptic states. It was a study of this condition that attracted his attention to that form of headaches so peculiarly typical in women, the headaches in the occipital region radiating behind the ear and down the cervical spine, associated with soreness and stiffness. He set out with the idea that these changes —which are so often premenstrual, but not always—may be due to altered activity of the posterior pituitary (though possibly in part to a swelling or hyperemia of this structure), but more probably due to some interference with osmosis, the cell membrane of Gley, and the spinal nerve roots.

While some were helped by thyroid and some by corpus luteum, he has found that in a number of cases placental extract gives surprisingly effectual results; and when with peculiar headaches of this type we

find not infrequently psychic disturbance characterized by restlessness and inability to be physically or mentally quiet—a typical mental wanderlust, as we might call it—it is the first thought to attribute both to the same cause, and if this be true, what stretch of the imagination is it to conclude that mental wanderlust, without these typical headaches, may be due to the same cause? Only by dissociating associated phenomena can we lay the finger of investigation on many of our puzzling problems. Furthermore, when by the therapeutic application of placental extract the physical manifestations disappear and the psychic peculiarities often improve noticeably, the test of therapy justifies the conclusion that the primary conception was correct.

Since in many of these cases the blood-pressure was above normal, a test was made concerning high blood-pressure in general, and it became apparent that a number of the endocrines enter into the causation of high blood-pressure in many cases, and metabolic changes occurring in the body serve as an explanation for the apparently contradictory basic theories. Hence it is apparent to him that there are no one, two, or three endocrine causes of high blood-pressure, but that each individual with this symptom must be viewed as a distinct entity, and the gland aberrations of that individual must be sought for and disclosed, of course, first taking physical states into consideration.

Pursuing this plan from the basis of menstruation alone, and treating the conditions of amenorrhea, menorrhagia, metrorrhagia, and dysmenorrhea by endocrines, not infrequently he noticed a reduction of the blood-pressure, even though no attempt at a solution of the primary cause was in mind at the time; and taking a large number of patients at the climacteric period and noting their symptoms after this basic experience, the fact was likewise disclosed that in many cases the blood-pressure was noticeably reduced.

Considering this material, the fact stands out that thyroid minus and pituitary plus explain a certain proportion of cases of high blood-pressure. When this is traced back to the domain of physiology, it suggests the influence which the thyroid and the pituitary probably have on the cerebrospinal fluid, and on the kidneys and their excretory function; but to state that a pituitary minus may not be associated with high cerebrospinal fluid pressure is to disregard entirely the metabolic changes associated with endocrine activities and to overlook the relation of either plus or minus pituitary to the osmosis and interchange in the cerebrospinal fluid. For while diabetes insipidus is attributed to pituitary minus, he is inclined to believe that in some cases pituitary plus increases the urinary output. So, reviewing the theoretical, the physiological, and the therapeutic conditions, he has become satisfied that we have in placental extract a substance which should be ranked among our therapeutic agencies as worthy of study. If posterior pituitary does half the harm for which, in his opinion, its overactivity is responsible; if placental extract does only half as much as he has gleaned from his therapeutic endeavors, he feels that he may still safely suggest that the important factor concerning placental extract is its ability to influence the posterior pituitary and to stimulate the anterior pituitary and the adrenal cortex.

The Treatment of Exophthalmic Goitre by Radiations.

Burrows and Morison, in the *Proceedings of the Royal Society of Medicine*, state that the immediate effect of irradiation seems to be an inhibition of the secretory function of the gland, and the pulse-rate will rise again after an interval if no further treatment be given. Prolonged treatment sets up a more permanent fibrotic process, so well seen by surgeons who attempt excision of part of the gland after prolonged *x*-ray treatment. This is possibly an exaggerated manifestation of the normal process of auto-recovery.

Severe cases of exophthalmic goitre usually follow a severe nervous cause. The thyroid gland is not necessarily greatly enlarged. Moreover, it is possible that the

quality as well as the quantity of thyroid secretion is changed. Removal of the thyroid factor may still in bad cases leave behind ameliorated, but still severe, nervous symptoms such as palpitation, exophthalmos, and indigestion or diarrhea, though not usually the last. These symptoms, however, commonly abate a great deal as time goes on. It is in connection with these cases that the interval of complete stoppage of both *x*-ray and radium treatment already mentioned is so useful. Here a warning may with advantage be uttered against too rigorous a rest and dietetic treatment being insisted upon in chronic cases, for it may engender in the patients' minds a feeling of depression and hopeless chronic invalidism hindering rather than aiding recovery. They should return as nearly as possible during that interval to normal life.

The most notable features to be observed in judging the progress of a case are as follows:

The first sign of improvement is a feeling of well-being. This can usually be recorded by the end of the third week. The patient gains confidence and is anxious to continue treatment.

The pulse-rate as a rule, after a quick drop followed by a slight rise, gradually gets slower. It may fall as low as sixty beats per minute sometimes, but they have not seen a case of artificially produced myxedema after even the most prolonged and severe treatment. If this is possible, and such cases are reported, it is obvious that the radiologist has an excellent method at command for stopping hyperthyroidism. Not infrequently some slight quickness in the rate of the pulse may remain, together with a little palpitation. The screen examination of a large number of hearts in exophthalmic goitre, and the estimation of the condition of the left ventricle by the triangulation method, point to permanent damage occurring in a number of cases. In mild cases the heart muscle maintains its tone, and there is little or no trouble with the cardiac condition after the hyperthyroidism is cured. In medium cases of long standing and in severe cases the heart muscle loses tone. The screen examination presents the typical appearance of the "lying down heart," the cardioradiographic index increasing from the normal 7 to 14 mm. to 20 to 25 mm.

Thyroid secretion in association with the sympathetic nervous system increases catabolism greatly. Hence loss of weight is a prominent feature of exophthalmic goitre —failure to assimilate food is another factor. Examination of the intestinal tract by means of "the bismuth meal" reveals no constant nor definite lesion beyond a marked "intestinal hurry" in certain cases. Increase in weight is the best indication of good progress toward recovery, and with ray treatment it is often a remarkable phenomenon. In fact some patients justly complain of getting too fat, a sure sign that the catabolic processes are diminished and that food is better assimilated.

No particular symptom or sign goes first, but all gradually diminish, except that exophthalmos is the last to go, or may be the only sign to persist in a virtually cured patient. When the thyroid enlargement is not of long standing it steadily grows smaller under treatment and after.

Intercurrent infections and attacks of diarrhea delay the favorable progress of a case.

In all cases in which there is a definite focus of infection, whilst some improvement may be obtained by *x*-ray and radium treatment, no satisfactory progress will take place until the source of infection is removed.

The red blood corpuscles and the hemoglobin index are normal except in those cases associated with secondary anemia. There is little alteration in the total number of leucocytes, the tendency being toward a slight increase in our cases. Other observers state that a mild leucopenia may exist. The differential blood count nearly always shows a diminution of the polymorphonuclear leucocytes and an increase of the lymphocytes. They do not find that it bears any definite relationship to the severity of the disease or to the progress of the case under treatment.

The Treatment of Antepartum Hemorrhage.

In the *Proceedings of the Royal Society of Medicine* for November, 1920, TWEEDY states that it is an error to consider all antepartum hemorrhages other than those arising from placenta previa as accidental, yet this is a mistake commonly made by nurses and students. Of still greater importance is it to determine the amount of loss which brings the condition within the category of accidental hemorrhage. The standard at present varies in the compilation of different statistics and comparison of results is rendered difficult.

In the Rotunda Hospital the term is now not used unless the bleeding is sufficient to necessitate the presence of an assistant master, who has to make a diagnosis and is responsible for the woman's delivery. He is not summoned unless his presence is required in the interest of the patient, and many insignificant bleedings escape being recorded. Thus the fact is explained that during his entire mastership he reported but forty-nine cases of accidental and forty-five of unavoidable hemorrhage in 13,924 deliveries, and in the extern maternity forty-seven in 15,543 deliveries.

On the other hand, Sir William Smyly, in his first hospital report adopting a different standard, records forty-four cases in 3600 deliveries. Most of them, he writes, were of little consequence. Similarly St. Mary's Hospital, Manchester, encountered 105 cases of accidental hemorrhage in the two years 1913-14, eighty-three of which recovered under the measures applicable for the condition in its less severe form, namely, rupture of membranes, etc. Seven died in spite of this treatment, and fifteen were dealt with by more radical procedures. From these figures he infers that there were certainly twenty-two serious hemorrhages, but the remainder could probably be classed, with Sir William Smyly's cases, as "of little consequence."

Amongst his forty-nine patients, twenty-two were in serious danger and were treated by the vaginal plug. He lost two of his hospital patients, and in the extern maternity seven, a not surprising difference when it is remembered that greater difficulties are encountered in district work and the smaller experience of those in charge of the extern maternity. The plug was employed in five of the extern maternity deaths. His two deaths probably arose from intraperitoneal hemorrhage, for in one it is remarked that not more than a pint and a half of blood poured into the uterus, whilst in the other the notes say that the patient's condition improved whilst the plug was in. Labor started and the delivery was natural in three hours. She died after completion of the third stage.

In 1915 he returned to the Rotunda, and, in conjunction with Sir William Smyly and Purefoy, carried on the work of the institution for three years. They encountered twenty-three cases of accidental hemorrhage. They were then in possession of the knowledge that accidental hemorrhage might arise as the result of pregnancy toxemias, and this knowledge made them decide to perform Cæsarian section when the double complication was encountered in a severe form. They carried out the procedure three times with success. Intra-abdominal blood was observed in all three operations, and in one the ovarian artery beneath the Fallopian tube was bleeding. Of the remaining twenty-one, eight were plugged. No deaths occurred from loss of blood. One woman died from sepsis ten days after delivery. Thus his hospital experience comprises seventy-two cases in over 18,000 deliveries, with two deaths. Thirty were plugged. Smyly, working in the same institution, had five deaths in 3600 patients treated before his adoption of the plug.

These figures are convincing in their significance, and can only be explained on the assumption that the plug exercises a definite and pronounced influence in arresting hemorrhage. It does so by impeding the circulation in the uterine vessels. Various other explanations have been given of the plug's action, and many of these by their inaptitude have greatly prejudiced the

method. Many suppose that a back pressure on the blood-vessels is caused by the outpoured blood above the plug. This explanation is quite inadequate and justifies Berkeley and Bonney in writing that "on first consideration the logic of plugging the vagina to arrest bleeding that is going on some distance above it may not appear obvious, yet its efficacy in cases with free external hemorrhage is proven." These writers satisfy themselves that the efficacy of the plug depends on its increasing the power of the uterus to contract. When dealing with concealed accidental hemorrhage, however, with the accompanying uterine inertia, they are driven to express a doubt whether the plug can have any directly useful effect. They say "it is easy to apply" and that it has this great advantage, that it avoids rapid emptying of the uterus, a proceeding which always impresses severe shock on these patients. "We think there can be no doubt that in some of these cases the bleeding has stopped by the time the practitioner comes on the scene, and that plugging the vagina has the great advantage of compelling him to pursue a course of masterly inactivity."

A plug applied in the method recommended by these writers will not compress the vessels, for they apply it with the aid of a speculum and a forceps and use for this purpose rolls of cotton, each tied round with a string to facilitate removal. Tweedy feels sure it would not be possible to place in position one dozen such rolls as are portrayed in their illustration, and those adopting any similar technique must meet with disappointment.

He has quoted from the work of the above authors, not because they are singular in their views, but for the reason of their great eminence. They undoubtedly voice the popular opinion—*i.e.*, that it is useless to attempt the compression of blood-vessels by a vaginal plug.

On the other hand, he maintains that compression is accomplished with the plug which he applies, and has demonstrated this truth during the performance of several Cæsarian sections. These have afforded his assistants an opportunity of directly observing stoppage of pulsation in the uterine artery whilst pressure is made from below on a lateral fornix.

To plug efficiently the left hand should be passed into the vagina with the palmar surface directed toward the hollow of the sacrum, while the tips of the fingers lie behind the cervix. Small pieces of cotton-wool, squeezed out of lysol solution, and each the size of the thumb knuckle, are then taken and inserted by means of the right hand round the cervix. The fingers of the left hand are kept busy squeezing the pellets into a compact mass and forcing the spaces between them to permit the insertion of still another plug. This process is continued in a systematic manner from above downward till the vulva is reached and the vagina can hold no more. A T-bandage is applied to keep the plug in position, and an abdominal binder is fastened tightly from above downward to press the side walls of the uterus against the vaginal dam, and this completes the operation. A plug so applied will cause immediate cessation of hemorrhage, and when it is removed after the lapse of hours, so much blood only will be found as can be accounted for by the flow which took place during the operation.

The vaginal plug is not easy to apply, nor is its application harmless. Sometimes, in spite of our best efforts, we cannot at the first attempt insert sufficient material to stop the bleeding. In such cases the plug must be removed entirely and reinserted. On the second attempt the procedure will be found to have become much more easy on account of the dilatation of the vagina. Pain, distress and some shock always follow from its application, and superficial tearing of the mucous membrane of the vagina is almost certain to occur, whilst the possibility of rupture of the uterus is not to be discounted.

It is clear that the words "vaginal plug" mean in Dublin something different from that which they mean elsewhere, and critics must take this into consideration.

To what extent intraperitoneal hemor-

rhage can be controlled by a vaginal plug is still a matter of doubt. In the vicinity of the internal os, control is complete. On the other hand, it would utterly fail to stop a leakage from the ovarian artery. The latter supplies a relatively small amount of blood to the placenta, chiefly flowing to its upper portion where detachment is rare. When the main supply is cut off the loss of blood-pressure promotes coagulation in the sinus.

Hysterectomy has no place in the treatment of accidental hemorrhage, and finally it may be stated that rupture of the membranes does not contraindicate the vaginal plug.

Iodoform Poisoning.

GROSSMAN, in the *Medical Record* of November 6, 1920, in commenting on a case of his own, states that it was unusually interesting and instructive because the patient presented Kernig's sign, headache, hyperesthesia and a papular eruption. Iodoform poisoning from the small amount contained in a strip of 3 or 4 inches of gauze used as a patch in mastoid disease indicated an unusual susceptibility to the drug. Two possible channels of absorption may be considered: (1) From the wound directly; (2) by drainage through the Eustachian tube into the pharynx, and the poison then being swallowed into the stomach. The difficulties in diagnosis are obvious. The possibility of sinus thrombosis, meningitis, and brain abscess complicating operation upon the mastoid had to be carefully considered. Sinus thrombosis was ruled out by the irregular temperature, the absence of chills, the absence of local signs (dilatation of the superficial veins, edema of the eyelids, cyanosis, exophthalmus, and signs of extension into the jugular vein), and the negative blood culture. Brain abscess in the temporal lobe was excluded by the absence of any signs pointing to involvement of the left temporal lobe, as word deafness or sensory aphasia. The absence of any signs pointing to involvement of the pyramidal tracts or the cranial nerves. The normal fundi, the absence of intracranial pressure, and the absence of ataxia, nystagmus, rigidity of the neck, adiadochokinesis, and asynergy made a cerebellar abscess rather unlikely. Septic meningitis could not be ruled out until the spinal fluid was obtained. The normal spinal fluid immediately cleared up that suspicion. The prompt subsidence of the symptoms on the removal of the iodoform gauze, the characteristic protracted convalescence, and the presence of a positive reaction for iodoform in the sputum twelve days after the gauze had been removed point very strongly to the iodoform intoxication as the agent responsible for the symptoms in this case.

With the exception of hyperesthesia, no other sensory disturbances were present at any time. It is difficult to explain absence of the knee-jerks. The extreme hypotonia may in part be responsible. Souques has noted general absence of tendon reflexes in cases with wounds of the cranium involving the meninges. This, he believes, is due to mild infectious meningitis which passed unnoticed, and of which increase in pressure and albumen content in the spinal fluid were the only evidence. The marked Kernig in the presence of extreme hypotonia is also an unusual phnomenon.

[The interesting question arises as to whether the symptoms were due to iodoform or septic absorption.—ED.]

The Role of the Rectal Examination in Obstetrics.

PARKE, in the *New York Medical Journal* of November 6, 1920, asks: What advantage do we gain from this method? From the point of view of the patient, we avoid pushing any germs from the lower zone of the birth canal to the upper. An examination shortly before the completion of the second stage is less deleterious than repeated examinations over a period of twenty-four hours or more. From the doctor's view-point there is this to be said: There is no diversity of opinion as to the propriety of using sterile gloves, or in lieu

of that, preparing the hands as if for an operation, or indeed of doing both when making vaginal examinations. This takes time and, in winter especially, is hard on the hands, and soon causes chafing or worse. If one adopts the rectal method of examination it is necessary only to put on a clean rubber glove—it need not be sterile—apply a lubricant and insert the finger into the rectum and thus acquire all needed information without loss of time, or skin in scrubbing. By all needed information Parke means that we learn that the labor is progressing normally or, on the other hand, that it is not progressing normally, and some aid will have to be given. In the latter event, of course, he makes a vaginal examination, since one is going to work through the vagina.

He concludes there is a distinct risk, in making vaginal examinations, of carrying up into the birth canal organisms which under favorable conditions may prove deleterious.

One can learn from a rectal examination all that is necessary to know in order properly to conduct a delivery in ninety per cent of the cases.

From the patient's view-point this method does not go contrary to nature's method of protecting the puerperal woman.

From the doctor's view-point it is attended with much less waste of time and trouble, and is therefore a procedure well worth the effort spent in acquiring confidence in it.

Melæna Neonatorum Treated by Injection of Fresh Citrated Blood.

LAPAGE, in the *Proceedings of the Royal Society of Medicine* for July, 1920, which has just appeared, states that the first case he had was that of an infant in the hospital. The infant was brought blanched, with a severe attack of melæna neonatorum, to the out-patient clinic. He said to his clinical clerks that he should have to give an injection of fresh blood or of fresh serum. One of them offered at once to supply the blood, and the resident surgical officer and house surgeon drew off 20 Cc. of blood from his arm, mixing it with 7 gr. of sodium citrate, and they injected it into the external jugular vein of the infant. The next day the melena had ceased entirely, and there was no recurrence. The infant was less blanched, and made an uninterrupted recovery. The coagulation time of the infant's blood was tested by a method which he had seen described in the *American Journal of Children's Diseases* for April, 1920, p. 269, and was found to be seventeen minutes approximately. Three weeks later it was found to be normal, about nine minutes. The coagulation time of the father and the mother was found to be normal.

The second case was that of a baby to whom he was called a few days later. This baby was exceptionally big, but he had had very severe melena, his blood coagulation time was much delayed, and he was going downhill rapidly. The case was urgent, and it was late at night, so he had no time to select the donor by scientific methods, but he obtained the blood of a friend of the father, and injected 15 Cc. of citrated blood. In this case also the melena ceased at once, and except for the passage of two more stools, which contained meconium mixed with blood, and which had probably been in the intestines from before the time of the injections, the child made an uninterrupted recovery. The coagulation time in the second case was over seventeen minutes at the time of the injection, and remained at seventeen minutes for some days, but about a week afterwards it had come down to approximately ten minutes.

With regard to the technique, the injection of fresh citrated blood into the jugular vein is by no means an easy operation, because the parts are so small, and it is his intention to use in the future the superior longitudinal sinus for such injections.

This method of treatment is not new. Koplik reports that he has made use of citrated blood and found it brilliantly effective, one transfusion being all that is necessary. He also says that horse serum

and gelatin are not nearly so satisfactory. Other authors give fresh serum subcutaneously in 10-Cc. doses. J. E. Welch recommends injections of normal serum subcutaneously, 10 Cc. three times a day. However Lapage is doubtful whether the serum injected subcutaneously is likely to prove as effective as intravenous injection of fresh blood from a suitable donor.

With regard to the question as to whether the blood of the mother can be used, it is quite possible, according to Koplik, that this will prove suitable, and in this case there is not likely to be any need for the classification of the donor and recipient, but of course this is not always a feasible plan.

The Toxicity of Alcoholic Liquids.

In an editorial on this subject, the *Lancet* of October 30, 1920, says the question of the effects of alcohol on the human organism is again approached in a recent report issued by the Medical Research Council, and in certain directions the results recorded in previous reports issued by the same authority are confirmed. The experiments described in this latest report include not only the examination of the effects of alcohol, but some other drugs during normal and fatigued conditions. For the moment, however, it confines itself to the findings in regard to alcohol. The tests were based on the precision with which dots could be inked on a traveling tape on which small circular areas were plotted out.

The authors are William McDougall, F.R.S., and May Smith, M.A., from the Psychological Laboratory, Oxford. They point out chiefly that a more extended investigation is necessary in the light of their interesting discovery that in the course of the protracted figure effects following several nights' loss of sleep, alcohol acts deleteriously during the stages of increasing inefficiency, whereas it acts beneficially as the subject later begins to regain his previous efficiency. At the former stage, for instance, it increases the errors, but at the latter it reduces them. The suggestion is made, as an outcome of these investigations, that an important cause of the conflicting results of past workers may be due to the stage or degree of fatigue when alcohol was taken.

Blood Analyses Following Acacia-Glucose Injection.

WHITE and ERLANGER, in the *American Journal of Physiology* for November, 1920, state that a strongly hypertonic glucose and gum acacia solution was injected intravenously into normal, asphyxiated, and shocked dogs, and the resultant changes in blood volume and composition were studied.

The immediate effect was a marked increase in blood volume; in normal and asphyxiated animals the blood volume then gradually fell toward, but did not completely return to, normal in several hours.

The blood column, markedly diminished in shock, is increased to above its normal level by the injection and then gradually falls to or below its normal level.

The absolute plasma protein is increased slightly, or not at all, in normal animals and in asphyxiated animals; in an animal which had been bled there was a slight increase when the amount withdrawn was allowed for. The absolute amount of plasma protein is markedly diminished in shock, is increased by the injection, and the increase continues for some time after the injection. It is believed that at least a part of the increase in plasma protein following the injection in shock is due to a passage of protein through the vessel walls.

Gum acacia seems to take the place of plasma protein in holding water in the circulation.

There is a marked hyperglycemia immediately after the injection in normal animals; this is accentuated by morphine and asphyxia. The blood sugar value falls to or nearly to normal within two hours. In shocked animals the blood sugar behaves much as in normal animals. There is only a trace of sugar excreted by normal animals excepting when morphine or asphyxia causes marked glycosuria. Shocked ani-

mals without morphine excrete some sugar unless, as a result of the shock, there is a suppression of urine.

The fluid drawn into the blood stream brings with it chlorides in concentration equal to the chloride concentration of plasma, but the diffusion into the blood stream of sufficient additional chlorides to bring the chloride concentration of injected fluid up to that of plasma is not complete for several hours.

The entrance of urea into the plasma takes place with such facility that the non-protein nitrogen concentration of the plasma remains constant.

There is no suppression of urine in normal animals as a result of the injection; if anything, the rate of secretion is slightly increased.

The crystalloid osmotic tension of the plasma does not remain constant.

No hemolysis, hematuria, hemoglobinuria, albuminuria, cylindruria, fluctuations in body temperature, or any other untoward effects were observed as a result of the injections.

Surgical and Genito-Urinary Therapeutics

Foot Abnormalities and Their Management.

MEBANE (*The Military Surgeon*, October, 1920) notes that for the practical management of these cases three questions required solution: (1) What should we consider as a normal foot? (2) What are the causes of foot trouble? (3) What is the most practical method of treating foot cases under army conditions?

In practice it was found that only two conditions need be met for a foot to be considered normal in the army sense—*i.e.*, a foot on which a man can march and fight. The requirements are that there must be unrestricted motion of the foot joints, and that the line of weight-bearing must pass through the forefoot. Such considerations as height of arches are unimportant. Men accepted for the service on this basis had little foot trouble, and if trouble did develop it responded to treatment in the great majority of cases. On the other hand men accepted in violation of these requirements, such as cases of flaccid flatfeet with abduction and eversion, rigid or spastic flatfeet, rigid arthritic or post-traumatic feet, marked cavus, ankle valgus or varus following fracture, marked hallux valgus, hallux rigidus, and amputation or severe derangements of the joints of the great toe, could only in a few instances be made fit for duty and in many cases were discharged from service.

Of the minor abnormalities, trauma due to wearing improper shoes played the greatest part. Abnormalities due to congenital causes or to trauma prior to entering the service were beyond control, and unless the disability was slight men with such disabilities were not accepted for full duty. With the men accepted for service it was found that much could be done to minimize the amount of foot trouble. Trouble resulting from trauma of improper shoes and overtaxing the feet could be prevented. Likewise much of the disability from infection could be controlled. The measures found useful in preventing foot trouble were proper shoes, correction of faulty attitudes of walking, use of "foot strengthening" exercises, prevention of overtaxing, and elimination of infectious foci.

The shoe question for the soldier has been solved by the Munson shoe. This shoe possesses all the qualities desired for the average adult. The inner line is nearly straight. The heel is broad. The shank is stiff. The toe cap is wide. It gives the necessary support to the foot and at the same time allows development. Support for the adult foot, particularly in the early

stages of military training, is very desirable. This support is required on account of atrophy of the foot muscles which has resulted from the prolonged wearing of the short and narrow shoes of civilian life. The shoes must be properly fitted and at least a half-inch space must be allowed in front of the great toe. The degree of foot development that has resulted among soldiers from the use of properly fitted Munson shoes has proven a revelation to the surgeons.

The most frequently encountered faulty attitude of walking among soldiers is that of "toeing out." This attitude by throwing excessive weight on the weak inner border of the foot invites strain of the longitudinal arch. This danger is increased when heavy packs are carried. The remedy lies in teaching the importance of walking correctly, with the inner borders of the feet parallel. It has also been found that it is well to avoid excessive "toeing out" while standing. Strain can be prevented among those who are required to stand for long periods by frequent changes of attitude, standing with inner borders of the feet parallel, "toeing in," and turning over on the outer borders of the feet.

The use of four simple exercises has been found of great benefit in strengthening the foot muscles of soldiers in training. They must be given with the men wearing correctly fitting shoes so that the play necessary for muscle development may occur. The exercises require only a few minutes and can be given daily as part of the setting-up exercises. Each exercise is repeated about ten times. The exercises are:

Rising on the outer borders of the feet. In this exercise the men stand with their feet six inches apart and the inner borders parallel. The exercise is done on counts given by the officer or noncom in command. On the count 1 the men rise on the outer border of the feet, and on 2 they come back to their standing position.

Knee-twisting exercise. In this exercise the position of the feet is the same as in the above. The feet remain fixed and the motion is a twisting outward of the thighs and knees, which elevates the arches. The movement is accomplished entirely by the external rotators of thigh. It is likewise performed to two counts. On 1 the knees and thighs are twisted out, and on 2 the men relax, allowing the knees to return to their original position.

Toe exercises. The position of the feet is the same. The exercise is done by first bending up or dorsiflexing the toes, bending down or plantar flexing the toes, separating the toes, and then coming to rest. It is done to 4 counts: 1 toes up; 2 toes down; 3 separate; 4 rest.

Rising on toes. The men standing with feet parallel and six inches apart rise up on their toes as far as possible, turning their heels out as they rise. They then descend gradually. They should not "flop down." This exercise is given in 2 counts: 1 up; 2 down.

Foot trouble from overtaxing the feet is likely to occur in changing occupations, from one requiring little use of the feet to one where much is required, as in the case of soldiers, or in starting to walk again after an illness or operation. Among soldiers it was found that trouble could be avoided by increasing the foot work gradually. By drilling new recruits on a plan that provided for frequent rests and changes of instruction no time was lost and little foot disability resulted. The use of "foot strengthening" exercises was also beneficial. On the first sign of trouble, strapping the arches and relieving the strain on the longitudinal arches by raising the inner border of the shoe was practiced. During convalescence following illness or operation it was found an excellent plan to strengthen the foot and leg muscles by massage and exercises before the patient began to walk. Walking was allowed only in high shoes. Too much emphasis cannot be laid on the dangers of slippers or loose hospital shoes. Such shoes give no support to the ligaments and muscles weakened by disease and non-use. Strapping and shoe alterations were made use of if there was any evidence of weakening of the longitudinal arch.

Infection operated in the causation of foot trouble in two ways. In some cases the organisms were actually present in the joints and soft tissues of the foot. The diagnosis in such cases was usually relatively simple. In the cases where the trouble resulted from focal infection the question was not always so simple. Many cases cleared up with the treatment of an old gonorrhea, the removal of diseased tonsils, or attention to the teeth. The possibility of focal infection should always be considered in treating foot cases.

The correction of foot deformities of recruits by operation has been almost entirely abandoned. The reason for this is that experience has shown that a strong marching foot cannot be obtained in a reasonable time by operative procedures. Much better results have been obtained by conservative measures. The use of adhesive plaster, felt and simple orthopedic alterations of the Munson shoe is sufficient to mechanically correct any case that is worth retaining in the service. The importance of strengthening weakened foot structures has not received the attention it deserves. The simple mechanical correction of a defect does not cure the condition. Stretched structures tend to regain their normal condition when relieved of strain by a correct appliance, but unless the muscles are strengthened so that they can stand the strain, removal of the appliance is followed by a recurrence of the original condition. We should aim in the treatment of static deformities of the foot to place the weight-bearing where it belongs by mechanical means and then educate the muscles to maintain it, so that mechanical aids can be dispensed with.

The use of some mechanical means to correct a static defect such as a weak longitudinal arch seems like a logical procedure, and in practice has been followed by good results. By such means weakened structures are relieved of abnormal strain, weight-bearing can be transferred to stronger parts, and the individual can be allowed about without danger of aggravating his condition. In civil life plates, felt pads and shoe alterations have been used as mechanical means to accomplish this end. In military service plates are impractical; they are expensive; they splint the foot and thus prevent development of the muscles. They also create a sense of dependency that is difficult to overcome. Felt supporters placed in the shoes are open to the same objections, and when strapped on the feet are dirty and render satisfactory use of the foot exercises impossible. Orthopedic shoe alterations have been found the only practical method under army conditions.

For longitudinal arch trouble, simple inside leather wedges have been found entirely satisfactory. The wedges are inserted between the layers of sole and heel of the Munson shoe. The thickness of the wedges varies from ⅛ to ¼ of an inch, depending on the case. Extending the heel or reënforcement of the shank of the Munson shoe was found unnecessary. It is believed that failure to obtain results from shoe alterations has been due to the use of improper shoes, failure to adapt the height of the wedge to individual requirements, failure to properly carry out treatment, or to improperly made alterations. In reference to the last attention is particularly called to alterations nailed on the outside of the shoe. Such alterations, in addition to being unsightly, wear down rapidly and a uniform correction is not maintained.

For affections of the anterior arch the anterior wedge has been used. The wedge has been inserted between the layers of the sole in such a position as to transfer the weight-bearing from the heads to the shafts of the metatarsal bones. For successful results it has been found necessary to determine the proper position of the wedge by inserting it with the patient present and altering the location until relief of the symptoms has been obtained. A modification of the anterior wedge has been made use of in cavus cases. A broader wedge, placed further back, has been used, similarly inserted, so that weight-bearing was evenly distributed along the outer border of the

foot. Cases of short heel tendon were treated by raising the heel of the shoe.

Measures to strengthen the weakened foot structures were commenced as soon as shoe alterations had been made. Graduated foot exercises were the most important means of accomplishing this end, but massage and contrast baths were made use of when possible. The foot exercises were ordered for cases of poor development of the foot muscles, subacute and chronic flat feet, ankle valgus, cavus, and the affections of the anterior arch. In acute foot strain they were not used until the acute symptoms had subsided. For the treatment of rigid or spastic flat feet preliminary treatment is required to convert the condition into a simple flatfoot.

The Conquest of Venereal Infection.

Rout (*New York Medical Journal*, Oct. 9, 1920) under this encouraging title states that in the army venereal disease has been conquered. Wherever prophylaxis was properly applied, at least two-thirds of the cases of venereal disease were eliminated. This is the official statement of the American army, and it coincides with that of the Canadian and Australian armies, on broad lines.

The author notes that in August and September, 1917, over five thousand British troops came to Paris on leave without prophylactic measures being provided, and 1038 became infected, over twenty per cent. Leave was then closed down. Three prophylactic stations were established and prophylactic tubes were issued, with the result that within the next six months some twenty-five thousand to thirty thousand troops came on leave to Paris, the amount of venereal infection among them being reduced to less than 3 per cent.

Among the Anzacs in five months there were only 20 venereal infections recorded at the Medical Report Center, whereas many hundreds of infections were recorded against other troops.

In November and December, a period of five weeks, when the supplies of prophylactic outfits ran out, there were 24 infections, four more than during the previous five months. The most striking return was one furnished for the twenty-two days ending October 17, 1918, because a special medical effort was made to protect the Anzac troops during September-October, the result being as follows: Venereal infections recorded at Medical Report Center, Paris, for twenty-two days ending October 17, 1918: no New Zealanders, no Australians, thirty-three Canadians, and twenty-four English; and a further return for the six weeks ending October 31, 1918, gave only three infections among the Anzac troops and forty-two among the English. As the New Zealanders and Australians were the only troops given an unlimited supply of prophylatic outfits, the conclusion is obvious. When men and women are properly instructed in the method of preventing infection and are supplied with proper medicaments, venereal disease can be practically extirpated except among the drunken, and experience shows quite clearly that the vast majority of those who risk infection are not in a state of alcoholism when they do so.

Further the providing of this means does not act as an incentive to immorality; rather it is a continual reminder of the dangers likely to be incurred by loose and irregular relationship.

The microbes of venereal disease grow almost exclusively in the genital passages of men and women. If these passages are kept clean and disinfected, the microbes will not grow. Venereal disease does not always spring from immorality, or even from sex-relationship, but from contact with infective matter. Using some sort of grease beforehand prevents direct contact; the microbes will not pass through a film of oil. They will not adhere to a greasy surface, hence are easily washed off with soap and water after contact, and soap is destructive of the microbes both of syphilis and gonorrhea. It is seldom that a person who has used vaselin beforehand and soap and water afterward becomes infected; if so, that merely proves that the precautions were carelessly carried out. Urinating im-

mediately after contact is also a protection. Bathing with cold water is also protective. There is no excuse for doing nothing, and little excuse for delay; but if there has been delay, skilled treatment should be sought as soon as possible. The kind of precaution necessary to insure protection is dependent on the kind of risk run. Only the persons themselves know the nature of the contact, the length of time occupied, the number of repetitions, and so forth. Contact with infective matter for a few moments is one thing; contact with infective matter for a whole night, quite another. But every irregular contact is a risk; avoid risks, or disinfect immediately.

As a result of war and after-war conditions, venereal disease has greatly increased in all the Allied and enemy countries; probably no European country has less than three or four times the amount of disease it had in 1913-14. Once in the lifetime of every generation all mankind must pass through the bodies of its women. Shall we make and keep those bodies clean? Knowledge has given us power, and with this new power we shall be able to rid our nation of the most dreadful of all human scourges. Victory is within sight. When it comes sex will regain its loveliness.

Radium Treatment of X-Ray Burns.

QUIGLEY (*Urologic and Cutaneous Review*, October, 1920) suggests this novel and original form of treatment on the basis of clinical experience. He states that the good effect of radium treatment is apparent not only in the old chronic case but also in acute *x*-ray burns, and if used in the acute stage a smaller dose will suffice and less tissue will be destroyed. Some of the cases treated by the author have been so extensive that there was no hope of the skin filling in the defect, and in these cases skin-grafting was done, always with a successful result. These same cases had been repeatedly skin-grafted before the use of radium without success.

It is a notable fact that in every case treated many different methods of treatment had been tried before resorting to radium—curetting, skin-grafting, skin-sliding, washes, salves, ointments, violet rays, etc.; but in no case were these things of the slightest benefit to the patient. On the other hand these ill-advised measures increased the days of suffering and invalidism and contributed to the destruction of tissue and often the mutilation of precious anatomical structures.

It would seem that with the excellent results to be obtained with radium in these cases and the entire lack of favorable results with other methods of treatment, the patient should be advised to seek radium element as soon as it is known that he has been administered an overdose of *x*-ray.

The physiological effect of radium rays on tissues is entirely different from that of the *x*-ray.

The *x*-ray causes chronic ulcers that do not heal and lead to the development of cancer. Radium burns always heal quickly and easily unless there is some constitutional disturbance such as diabetes or nephritis, and there is no tendency to cancer formation.

The rays of *x*-ray are irritating and poisonous, the rays of radium are benign and healing. In several thousand radium applications covering a period of seven years the author has burned every patient to whom he has applied radium. In using *x*-ray he would not knowingly burn any patient.

A New Principle in Surgery of the Large Intestine.

Under this somewhat startling title DR. FRITZ PENDL (*Archiv f. Klin. Chirurgie*, Sept. 20, 1920) announces a new thought and one of great value; to wit, the free use of castor oil before and immediately after operation on the large intestine and rectum. This will give better results than have been obtained by the method, which he believes has been universal, of postoperatively locking the bowels for some days. He observes that circular suture will hold, or if it leaks this leakage will not occur

until the period when granulations have offered an adequate protection against any serious danger. He advises that the anus be kept open by a glass tube of proper shape which may be left in place for many days.

Tetanus and its Antitoxin.

JOSEPH MCFARLAND in a leading article in the *Pennsylvania Medical Journal* for November, 1920, observes that following the introduction of the antitoxin treatment of diphtheria by Behring, in 1890, about a decade was required to convince the medical profession of its prophylactic and therapeutic value, and another decade had to pass before statistical computations based upon millions of cases could be made convincing as to its value.

When Park, in 1912, published his tabulation of cases from eighteen of the world's largest cities, there was no other possible explanation of the diminution of the death-rate from 66 per 100,000 among 16,526,135 population in 1890, to 19 per 100,000 among 22,790,000 in 1905, than that it resulted from the increasing use of the antitoxin, and a better acquaintance with the methods of administering it.

The statistical studies of diphtheria, with regard to the value of antitoxin in its treatment, were however comparatively simple when contrasted with similar studies upon tetanus and its antitoxin.

Tetanus antitoxin, first made by Behring and Kitasato, in the same year (1890) as the diphtheria antitoxin, and more and more hopefully received and employed as the benefits derived from the diphtheria antitoxin were made more and more clear, failed to give the same conclusive evidence of usefulness.

There were many explanations of this. In the first place, diphtheria is a common disease, tetanus a rare one. Diphtheria is a readily transmissible, highly contagious disease, and tetanus scarcely at all so. The former was therefore early made the subject of strict registration, the latter only much later made reportable. For long it was quite enough to report it when the patient was dead. Statistics could be easily computed from the entire number of cases occurring in diphtheria, while only from the number dying in tetanus. Only in hospitals, where both the number of cases and number of deaths were known, could the two be satisfactorily compared, and in any of them the total number of cases was too small.

Such was the state of affairs with regard to tetanus when Moschowitz published his review of the subject in 1900. He had to cull out of the literature of medicine the cases reported to have been treated with antitoxin, and those reported as not having been so treated, and then make his comparisons. This was both difficult and, as regards error, dangerous. Many whose patients recovered from tetanus without the antitoxin hastened to report the fact, while others, whose patients died in spite of it, suppressed the information, fearing that the publication, appearing before the failure could be properly explained, might be productive of harmful results.

However, comparing the two groups of cases as well as he was able, Moschowitz came to the conclusion that under the antitoxin treatment the death-rate from tetanus had been reduced from 80 per cent, at which it stood in the non-antitoxin cases, to 40 per cent in the antitoxin-treated cases.

Most subsequent writers, though few have found so high a percentage of benefit as Moschowitz, find a decided diminution in the death-rate in favor of the antitoxin-treated cases.

Their difficulties were much the same as those of Moschowitz. All of the cases of the disease had not been reported; those reported had not been similarly treated; those that had been treated had received very different doses and methods of administration, so as not to be easily comparable —there was no satisfactory standard of comparison.

It is therefore with much interest and satisfaction that the author has read the "Analysis of 1458 cases of tetanus that occurred in home military hospitals, during the years 1914-1918," published by Sir

David Bruce in the *Journal of Hygiene*, July, 1920, vol. xix, No. 1.

The number of wounded soldiers sent from the western front between August, 1914, and November, 1918, was 1,242,000. The number of tetanus cases among them was 1458, and the statistical study of them is the substance of the paper, the facts being displayed in many charts and tables.

The first thing to strike the reader is the overwhelming disproportion of cases that occurred in the months of September and October of 1914.

In August of that year there were 3 per 1000; in September, 9 per 1000; in October, 7.5 per 1000; and then, though the war goes on as usual, and multitudes of men are wounded, the incidence of the disease declines to about 3 per 1000, above which figure it never again rises. This is to be explained by the fact that at the very beginning of the war the importance of tetanus was not yet recognized, and no satisfactory means was at hand either to prevent its occurrence or to combat it where it already existed.

In answering the question, "Why this continuous and progressive diminution leading towards the final extinction of tetanus as a complication of wounds took place?" Bruce answers as follows: "Unfortunately the causes are mixed, and two separate measures were introduced for the prevention of the occurrence of tetanus." Of these he speaks as follows:

"The surgeon's knife, after all is said and done, is the best means of preventing the occurrence of tetanus after the wound has been inflicted. Dead putrefying tissue is the best culture medium for the anaerobe. At the beginning of the war the treatment of wounds was not thorough at the primary operation. It was thought sufficient to wash out the wound and apply an antiseptic. Controversy was acute in regard to the merits of chlorine, common salt, bipp, flavine, etc. It was only when surgical teams were boldly pushed to the front, and thorough excision of the damaged tissues in the wounds carried out, with primary or secondary delayed suture, that any real advance was made in the treatment. Any one who saw these wounds in the base hospitals in France a few days after they had been inflicted must have been struck by the extraordinary results. One could almost foresee the time when the antitetanic serum would no longer be required.

"Some two months after the beginning of the war it was ordered that every wounded man should receive an injection of 500 units of antitetanic serum as soon after he was wounded as possible. This had a most important influence on the incidence of tetanus among the wounded men. . . The ratio of the number of cases of tetanus to the number of wounded was several times as high in September and October as in November and December. In September it was 9 per 1000, in December it fell to 1.4 per 1000. Now this fall was undoubtedly due to the fact that few prophylactic inoculations of antitetanic serum were made until the middle of October. It appears that only a small quantity of the serum was taken out with the expeditionary force in August, 1914, and this only for the purpose of treatment. It was not until the number of cases of tetanus became alarming that steps were taken to secure a large supply and insure that every wounded man received a prophylactic dose. It was not until about the middle of October that prophylactic inoculation was introduced on anything like an adequate scale, and it was at this time that the remarkable fall in the incidence of the disease took place."

In regard to the prophylactic employment of the serum, Bruce comes to the following conclusions: "At the beginning of the war one prophylactic inoculation was the rule, but in June, 1917, it was ordered that four should be given at intervals of seven days, each injection to consist of 500 units." Col. Lingard, of Queen Mary's Military Hospital, Walley, gives some interesting details bearing upon this question. He states that since the order was issued on the 17th of June, 1917, and had time to be introduced and carried into effect, 15,152 surgical patients of the British expeditionary force have been admitted to his hospital,

without a single case of tetanus developing. He considers this a most encouraging and satisfactory result, and that it justifies all the extra expense and labor involved in the multiple inoculations.

The prophylactic inoculations increase the duration of the incubation period. "With one inoculation the average incubation is 38.2 days; with two, 33.6 days; with three, 51 days; and with four or more, 83.7 days.

"Wounded men who received one inoculation had a case mortality of 25.1 per cent; those who received two, 21.3 per cent; three, 16.5 per cent; and four or more, 7.1 per cent."

The best dose for prophylactic purposes is placed at 500 units.

In regard to the therapeutic value of the antitetanic serum, Bruce has much to say:

"The only specific therapeutic treatment is by the injection of tetanus antitoxin. It has been proved up to the hilt that the prophylactic inoculation of antitoxin is of very great value; lowering the incidence, lengthening the period of incubation, and lessening the death-rate. But when an attempt is made to appraise the value of antitoxin, given after the symptoms of tetanus have declared themselves, great difficulty is met with. Wide differences of opinion are held, many holding that if given early and in sufficient quantity it acts powerfully for good; others doubting its usefulness but hesitating to discard it altogether. The latter argue that as it is the only rational specific drug against tetanus in our possession it would be wrong to withhold it in such a fatal disease as tetanus. They think there is an off chance that it may turn the scale in favor of the wounded man.

"In regard to the statistical proof of the value of antitoxin as a curative agent it is very doubtful if any truth can be arrived at by the study of the figures at our disposal. There is no uniformity in the treatment of tetanus in man. The men who suffer are also, as a rule, suffering from other grievous maladies—wounds, fractures, septicemias, pneumonias, hemorrhages, heart failures, etc., so that if a man dies it is impossible in many cases properly to fix the blame. Captain Golla, a member of the tetanus committee, has compared the results obtained from the use of therapeutic serum in this war with those of preserum days. He is of the opinion that the rate of mortality in cases of tetanus in this war which did not receive a prophylactic injection of antitoxin, but did receive therapeutic treatment, approaches very closely to the rate of mortality in preserum days. In other words, it would appear from his figures that the therapeutic use of serum is of little or no practical value in treatment. It is taught at the present time that tetanus toxin that has been taken up and fixed by the nerves or nerve cells is inaccessible to antitoxin. If a lethal dose has been taken up by the nerves and is traveling toward the nervous centers, before the serum treatment is begun, then no amount of antitoxin will save the patient.

"But in spite of these statistical considerations, and in view of the experimental results, it is clear that medical officers will continue, for the present, to give a case of tetanus the benefit of the doubt and use antitetanus serum therapeutically. As Ransom states, it may neutralize some of the free toxin in the blood and lymph, and prevent it ultimately entering the nervous system and causing death, when the toxin already admitted through the motor nerves is not sufficient to do so."

In regard to the best method of administration, Bruce falls back upon the experiments of Professor Sherrington, in stating that the intrathecal mode of injection is the best. Sherrington experimented upon 130 animals. Of these there were no recoveries when the injection was made intradurally into the cerebral tissues. Two recovered when the injection was made subcutaneously; 14 out of 25 recovered when the injection was made into the lumbar region of the spinal cord.

"One therefore would conclude that a dose of 20 Cc. of high potency serum, containing 16,000 units, given intrathecally in the first and second days, supplemented and continued by intramuscular and subcutaneous injections, would be sufficient to

keep the fluids of the body amply supplied with antitoxin.

"In England alone, during this war, it is probable that some two millions of prophylactic doses of antitetanic serum have been given. Out of this huge number only 11 cases of anaphylactic shock have been reported. All 11 cases recovered. No doubt these cases appear very alarming when they occur, but they are so rare that they may be looked upon as negligible.

"Two per cent of the cases of shock followed the intrathecal injections, 6 per cent the intravenous, 1.2 per cent the intramuscular, and 0.2 per cent the subcutaneous route of injection. It is evident from these figures that the most dangerous route for the therapeutic injection of antitetanic serum is the intravenous.

"Anaphylactic shock is by no means a rare phenomenon after therapeutic injections of antitetanic serum, and markedly reduces the questionable usefulness of therapeutic serum."

Treatment of Vascular Nevi with Radium.

MONTGOMERY and CULVER (*Boston Medical and Surgical Journal,* Sept. 30, 1920) observe that the influence of radium is most marked on large tuberous nevi; in which the growth, if it is progressive, is not alone stopped, but the tumor also shrinks in size, and the startling red color disappears. They call attention to the fact of the importance of the proper application.

Usually included among the vascular nevi, but not at all in the same pathological class, is the spider nevus. It consists of a bright-red, central point, with dilated capillaries radiating out from it. This is not at all amenable to radium treatment as it does not contain any nevus tissue or hyperplastic nevus blood-vessels to be acted upon by the gamma rays.

The dilated central point and the radiating capillaries are easily obliterated with the electrolytic needle.

The Effects of Inbreeding and Consanguineous Marriages.

It is noted in a leading article in the *British Medical Journal* of October 2, 1920, that the popular impression that inbreeding in animals and consanguineous marriages in man are bad for the race, probably depends to some extent on the opinion expressed in 1878 by Charles Darwin that "the consequences of close interbreeding carried on too long a time are, as is generally believed, loss of size, constitutional vigor and fertility, sometimes accompanied by a tendency to malformation." The matter, indeed, was regarded as so definitely settled that no experimental work was done for many years, and it is only within the last decade and a half that the problem has been again attacked.

Among the researches bearing on this question, that carried on for more than nine years by Dr. Helen Dean Kin, Assistant Professor of Embryology at the Wistar Institute of Anatomy and Biology, Philadelphia, deserves special attention on account of the minute care and attention to detail displayed, especially as regards hygienic and dietetic conditions. Albino rats were employed, and the experiments began in 1909 with two females that were mated twice with a brother from the same litter, and then twice with an unrelated male stock; for twenty-eight generations this programme was continued, all the females used being from inbred litters. In the earlier generations the inbred rats showed all the defects popularly supposed to appear in any closely inbred stock; thus many females were sterile, the litters were small, many of the rats were dwarfed and short-lived, and malformations, especially of the teeth, were common.

If the experiments had been stopped at this point the results would have confirmed the conclusion reached by Darwin and others, that inbreeding invariably leads to sterility and physical degeneration. Fortunately, however, many rats in the general stock colony, in which there was no inbreeding, showed the same features, and

it was found that the diet was at fault. After correcting the adverse factor in 1911 all the characteristics said to be typical of the dire effects of inbreeding were banished, and have never reappeared. These results confirm the conclusions of Gentry on swine and of various stock-breeders on horses and cattle (Chapeaurouge, Anderson) that there is not any general physiological law forbidding inbreeding, and that the results obtained depend largely on the character of the stock that is inbred.

Reduction of Old Dislocations of the Hip by Open Incision.

BUCHANAN (*Surgery, Gynecology and Obstetrics*, November, 1920) holds that analysis of these cases will show that, while open reduction in old hip luxations is usually difficult and not altogether devoid of danger, it is the operation of choice. In a large proportion of cases it greatly improves the use of the limb, and in very many restores its complete function. Where reduction is impossible, resection of the head may still be done to secure improved position of the limb. This operation, however, has a higher mortality and is followed by less perfect use.

If assorted into decades, it will be found that three open reductions were made in the eighties, 21 in the nineties, 20 in the first decade of the present century, and only six reported in the last ten years. The reason for the small number of cases reported in recent years is probably incident to the general use of the *x*-ray, which has rendered this diagnosis easy even to those not skilled in surgery.

In four cases the trochanter was chiseled through at the base, and after reduction had been accomplished, fixed back into place, once with screws and three times with silver wire. In 11 cases all muscular attachments were separated from the great trochanter, usually subperiosteally. In 30 cases, it was noted, the acetabulum was emptied of its connective-tissue filling with scissors, knife, or curette. In one case it was said to be empty. In one case the acetabulum content was not removed, and in it recurrence of the dislocation took place. Tenotomy of the adductors was resorted to in one case, and the chiseling of the rim of the acetabulum in another.

Of the 45 cases reported, 36 (80 per cent) had good results and 9 (20 per cent) had moderate improvement or poor results.

Buchanan reports a case of luxuation six months old. The acetabulum was freed through dissection. The limb was fixed in abduction to a long splint with slight traction.

Foot-drop followed the operation, but it finally disappeared. Eleven months after operation the patient exhibited a shortening of something slightly over an inch with abduction of 25 degrees and flexion of the hip of 35 degrees. He walked with a solid gait and without pain and was working as an automobile repairman.

The Causation of Appendicitis.

SHORT (*British Journal of Surgery*, October, 1920) contributes a somewhat exhaustive study on this subject bearing on the alleged increase of the affection, which he holds well corroborated by hospital and mortality statistics. He states that there is some evidence to show that the poorer classes, at any rate those living in institutions, show a relative immunity.

Thus he quotes a public school with 500 boys between eight and eighteen who were liberally fed, in which there were 19 cases of appendicitis. There have been four cases of appendicitis in the past five years in a children's home with an average of 950 inmates over eight; the diet consisting of bread with margarine, treacle, or dripping, and porridge daily with milk, together with tinned meat, potatoes, cabbage on certain days, and fresh meat with vegetables once a week. This shows a much lower incidence.

The author takes up the subject of the national distribution of appendicitis and of appendicitis in animals. He holds that the disease was present, but relatively rare, in this and other countries at the end of the

nineteenth century. Since then it has become very common in most civilized countries. The rise was more marked at first in towns and in the male sex, and probably in the better-off classes. The privations of war did not reduce it. The national distribution is very unequal.

In Asiatics, Africans and Polynesians it is rare, unless they take to European food. The disease appears not to occur in animals in the wild state, but it is quite common amongst animals in captivity; this especially applies to apes.

The most probable explanation as to the rise and incidence of appendicitis is some change in the food habits of the people. Wheat, flour, and grain, butter, tea, and coffee are all exonerated, as causative factors, as is sugar. Chocolate is looked upon with some doubt. Meat has been arraigned as a dominant cause. The author, after a careful study of the proof against it, holds that it must be held guiltless. As to the ultimate cause of appendicitis the author states that his tables have clearly demonstrated that during the past thirty years, and especially between 1890 and 1905, the dietary of England underwent a radical change by the importation of greatly increased quantities, not of one foodstuff, but of many. Preserved meats, butter, tea, cocoa and chocolate, rice and bananas, have all gone up. The importation of wheat rose immensely at the same time—60 million cwt. in 1890 and 97 million cwt. in 1905. Potatoes rose from about 2 million cwt. in 1890 to 3½ million cwt. in 1905. What does all this mean? It means, infallibly, that older home-grown foodstuffs have been more or less crowded out by the newer, more tasty, or more nourishing imported articles. Turnips, carrots, parsnips, leeks, asparagus, cabbage of various sorts, rhubarb, lettuce, celery, the coarser fruits and vegetables, oatmeal porridge, rye, barley, or other flours—in a word, the cellulose-containing foods—have been replaced in the dietary. It is not necessary to prove that the average Britisher eats less, absolutely, of any or all of these than did his forefathers. That is probably true—the author thinks there has been a marked falling off in the consumption of cellulose—but it would be difficult to prove. The point is that, relative to the total food eaten, cellulose consumption has fallen, and this has been mathematically demonstrated by the figures given, showing a rise in the personal use of meat, rice, cocoa, chocolate, sugar, and the rest. The consumption of wheaten flour in bread, and especially in cakes and pastry, has also risen, so has that of potatoes. Modern white bread contains less cellulose than the older browner breads. If a man took porridge for breakfast; soup, turnips, cabbage, and potatoes for dinner; and brown bread and butter and lettuce for tea in 1890, the bulk of cellulose in his total food has been reduced if he now adds bacon, Australian meat, and cakes to his meals, even if he does not drop out the porridge, greens, brown bread, and lettuce.

Let us see how this theory will fit out facts.

The time criterion is correct. It was between 1895 and 1905 that the great dilution occurred, and then appendicitis had its increase. Since then the dilution and the increase have both been much less marked.

The cellulose foods would be in favor longer in the country than the town, but nowadays country diet and town diet are much alike. The appendicitis rise began in the town.

In institutions, the older, simpler, and cheaper foods are still used, and are less diluted.

Apes in captivity do not get the coarse fibrous foods they did in the wild state.

During the later stages of the war, in spite of various privations, there was no great return to the old coarse foods. People ate less, but of the foods they were accustomed to. Soldiers got "pork and beans," Maconachie ration, and often fresh vegetables to protect them.

The national distribution of appendicitis is much in favor of the theory. Almost every report from countries where the disease is seldom seen amongst natives lays emphasis on the fact that they partake of

vegetables and other cellulose-containing foods. When individuals take up European habits, they drop their coarser articles of diet.

There is some direct experimental evidence on the subject. Von Knierien showed in 1885 that rabbits fed on a cellulose-free diet develop inflammation of the intestines, and especially of the cecum, which may be fatal. This does not occur in carnivora, whose cecum is usually small. Apparently the effect is mechanical, because horn-shavings suffice to avert the trouble. Cellulose, of course, is mainly unaffected by the digestive processes.

It is of course possible that some "vitamines," so-called, may be bound up with the cellulose. McCarrison showed that autoclaving their food produced in monkeys marked distention and congestion of the intestines, colitis, loss of lymphoid tissue, and invasion of the mucosa by bacteria.

At a large public school in Bristol, there has been noticed over a great number of years a remarkable seasonal association of one or two cases of appendicitis with epidemics of feverish colds and attacks of pharyngitis or tonsillitis popularly called "influenza," but probably not the same as true pandemic influenza. Krogius comments on the same association in Helsingfors. True pandemic influenza does not seem to act in the same way.

Concretions are formed *in situ*, from a mixture into which dried feces, calcareous secretions from the mucosa, and possibly, as Williams suggested, unabsorbed fat residues, all may enter. Probably the presence of a true concretion (not of a nodule of feces) proves that the mucosa is not normal. Concretions play an important part in determining an acute attack. There is often a very characteristic history of pain without fever for a day or two, due to appendicular colic, then fever from inflammation of the mucosa distal to the obstruction, owing to lack of drainage, then a day later, or less, sudden cessation of pain from perforation, followed by the signs of localized peritonitis.

Malignant Disease in the Lip and Jaw.

Cole *(Lancet,* Oct. 23, 1920) devotes his attention to a consideration of the means by which the disease may be eradicated, function restored, and deformity avoided. He quotes Broders' division of epithelioma of the lip into four grades, according to the differentiation of the cells. The least malignant type is that in which differentiation is most pronounced, whereas lack of differentiation indicates quick growth and more pronounced malignancy. The microscopical appearance is of little value as an indication for treatment, but may be of considerable value from the point of view of prognosis.

The relative rarity of the disease in females is an outstanding feature. In Broders' series of 537 cases the male patients numbered 526, whereas only 11 were females, a proportion of 49 to 1. C. Rowntree recorded particulars of 241 cases, males affected being 233 and females 8, a proportion of 29 to 1. In the Cancer Hospital malignant disease of the tongue in women is sufficiently uncommon. Malignant disease of the lip is even more so.

A large proportion of people affected are connected with outdoor activities, Broders noting that 68 per cent were thus employed. In a number of cases, too, the malignant lesion is preceded by a sore or ulcer. The freedom of the upper lip as compared with the lower is very striking; the lower lip is affected in 96 per cent of the cases, the remaining 4 per cent being those in which the upper lip and the angles of the mouth are the sites involved.

The lesion is usually situated to one side or other of the middle line, and shows a marked predilection for the muco-cutaneous surface. In those cases affecting the free border of the lip the influence of syphilis would appear to be a negligible factor. This is in marked contrast to the findings in malignant disease of the tongue, where a definite history of syphilis can be elicited in something like 95 per cent of the cases.

The question of differential diagnosis is not difficult, for the only lesion from which

epithelioma must be differentiated, apart from simple ulcers, is a primary chancre. The condition of the glands will readily serve to distinguish the one from the other lesion.

In the case of war wounds plastic surgery of the lip, as of all other facial defects arising similarly, is the plastic surgery of residual deformities. In other words, the responsible wounds have necessarily been allowed to cicatrize before any operative procedure to remedy the defect can be undertaken. This limitation is a matter most emphatically not of choice but of necessity. In the process of healing scar tissue is formed radiating to a variable extent according to the conformity and severity of the wound into the surrounding tissues, thereby diminishing their nutrition and leading to a loss in them of elasticity and plasticity which are their normal attributes.

The Knife Cautery in Surgery of the Thorax.

VAN PAING *(New York Medical Journal,* Oct. 30, 1920) lauds the knife cautery as a means of decreasing postoperative shock, hemorrhage, and the morbidity incident to convalescence. It can be used in incising the visceral pleura and the lung proper, in removing foreign bodies, such as bullets, fragments of high explosive shells, and particles of bone or bits of clothing carried into the lung tissue by the missile, and in operating for hemorrhage, lung abscess, or tumor. Before the advent of the knife cautery, pulmonary operations were the least developed and the least understood, from the view-point of technique and postoperative complications of all forms of surgery. The mortality rate was exceedingly high, shock and hemorrhage being the chief contributors, and the postoperative morbidity continued over a period of weeks or months.

Heretofore hemorrhage has been very difficult to control and postoperative oozing has caused a large number of deaths, owing to the facts that suture of lung tissue is unsatisfactory in the control of bleeding and the needle punctures themselves continue to bleed after the wound is closed. Lung tissue in particular must be free from oozing when the wound is closed, or the bleeding may continue for an indefinite period, exsanguinating the patient and being almost impossible to control without a large firm packing. The removal of this packing produces a return of bleeding, and while it is in position it causes incessant coughing, which so greatly weakens an already overburdened heart that cardiac dilatation is likely to occur. Furthermore, iodoform or cyanide gauze will in almost every case cause some symptoms of toxemia, the absorption being so rapid that often within twenty-four hours toxic symptoms manifest themselves by rigor, vomiting, high temperatures, and delirium.

The location of the primary incision on the chest wall should conform to the pulmonary area to be incised as nearly as possible. Preliminary outlining with iodine or silver nitrate stick is useful in that it remains as a guide after sterilization of the chest wall is complete. The incision may be U-shaped or longitudinal, conforming to the contour of the ribs, the primary flap consisting of skin, superficial and deep fascia down to the muscle. The muscles may be separated or incised. The number of ribs chosen is important, three being the usual number. All of them may be fractured, and reflected; or one may be fractured and removed and the one above and below displaced widely with a rib spreader or a Balfour abdominal retractor, which answers the same purpose. At this point the author makes a practice of tying all bleeding points and removing all forceps.

The parietal pleura is grasped with stomach forceps and the knife cautery at red heat is applied in a line about three inches in length and enlarged if necessary to admit of free access to the underlying structures. This incision in most instances should conform to the direction of the ribs. Four stomach forceps are applied to this

parietal incision, and it is retracted well above and below, and stitched to the visceral pleura with single 0 continuous catgut on a full curved fine needle.

The knife cautery at red heat is applied to the visceral layer, the length corresponding to the parietal incision. The anesthetic is removed as the lung is approached, and the cautery is used as one would use a scalpel in penetrating the lung tissue. With this method hemorrhage is practically absent except in the division of the larger blood-vessels, and for the sake of safety these should be tied.

The foreign body having been removed, or the abscess drained, as the case may be, the line of incision is permitted to collapse after the insertion of a fan-shaped drain of rubber tissue or a small cigarette drain, loosely covered and without gauze projecting from the end. If the wound edges are not apposed at the completion of the operation, one kidney suture of fine catgut may be used on a heated needle. The wound in the pleura may be partially closed over the drainage and buttonhole incision made through the skin. The rib retractor is removed and the fractured rib replaced; or removed entirely, in the pus cases. The skin is closed with interrupted silk or silkworm-gut and adhesive tape tightly applied, the wound is dressed, and a pneumonia jacket applied.

Traumatic Fat Necrosis of the Female Breast and its Differentiation from Carcinoma.

Lee and Adair *(Cornell University Medical Bulletin,* Volume X, No. 1) report two cases of fat necrosis of the breast. Clinically the simulation to carcinoma is very startling. In one case the amputation of the breast, muscles and axillary contents was performed, the operator believing that the tumor was malignant. In the other only local removal of the mass was practiced; a gross examination of the cross-section, in the operating-room, led to the belief that the induration was carcinomatous and the breast was removed, but the muscles were not sacrificed. The first patient received a definite trauma to the right breast. This was not followed by either tenderness or pain. Three months later a lump appeared about the size of a lime at the site of the former injury in the upper outer quadrant, slightly adherent to the skin, with some surface dimpling. Microscopic examination showed broad areas of fat necrosis.

The second patient had received hypodermoclysis of the right breast. One month later she accidentally noticed a small lump, about the size of a walnut, in the upper and inner part of the right breast at the site of the previous injection. This lump steadily increased in size. There was slight skin adherence.

At the Memorial Hospital the ratio of traumatic fat necrosis of the breast to mammary carcinoma is as 2 to 330, or 0.6 per cent.

Ewing reported that from the naked-eye appearance the growth could have been distinguished from carcinoma.

From these cases the authors conclude that traumatic fat necrosis of the female breast is a definite clinical entity. It must always be included with the benign lesions of the breast. Clinically it resembles carcinoma of the breast more closely than does any other tumor, and must be differentiated from it. A distinct history of trauma to the breast and a well-circumscribed, firm mass, showing rapid increase in size, unassociated with pain and without axillary nodes that are firm, suggest the possibility of fat necrosis. Local removal of such a mass is justifiable if a proper gross diagnosis can be made in the operating-room. Should the gross examination reveal carcinoma, complete amputation may then be performed. The diagnosis of traumatic fat necrosis of the breast by gross examination is possible. The gross features of this lesion should, therefore, be clearly understood by every surgeon. Further research, along chemical as well as along morphological lines, may throw additional light upon the real nature of this process.

Reviews

A Text-book of Pathology. By Dr. W. G. MacCallum. Second edition, thoroughly revised. W. B. Saunders Company, Philadelphia, 1920.

This remarkably well written and interesting text-book by Dr. MacCallum has now reached its second edition. It is quite freely illustrated, and is characterized from the standpoint of the author by clearness of diction and by the development of his text in a manner which makes it easy to read. The publisher has done his part by supplying good spacing between the lines, with a handsome paper, and this has enabled him to make the illustrations clearer and better than in many other works. The volume contains no less than 1155 pages, and space is saved from time to time by the use of small type when comparatively unimportant matter is being considered. A bibliography, having particular bearing upon the subject under discussion, is attached to each chapter.

As the author well says in the preface to the second edition, the four years which have passed since the book was first published have witnessed most of the unheard-of physical and mental insults brought by the war to human beings, most of the great epidemics, and all the misery and disease that have followed famine and cold. For this reason investigators have concentrated their attention upon the study of the infectious diseases, including those caused by animal parasites, upon wounds and the effects of poisonous gases, and upon the results of malnutrition, to the exclusion of all those diseases which we have constantly with us in times of peace. The result of this has been an immense addition to our knowledge along these lines. Many new illustrations have been added and some which did not seem particularly useful discarded.

The author endeavors from first to last to discuss disease as far as possible upon the basis of etiology, but he has dwelt only lightly upon the subject of resistance and immunity because these fields are now so large that they deserve special works of their own.

In reading the text of Dr. MacCallum's book, one is impressed with the fact that it is not a compilation of information gained from other authors, but that it is dominated by the information which he himself has gathered from his active work in pathology and morbid anatomy, with such additions from other authors as may seem necessary from time to time. In other words, the book is written by a master and deserves all the success that books so produced should receive. We expect to use it constantly.

Notes on the Medical Treatment of Disease. For Students and Practitioners. By Robert Dawson Rudolph, C.B.E., M.D., F.R.C.P. University of Toronto Press, 1921.

We are told in the preface that the aim of this book is to impress upon the student and practitioner broad principles for the medical treatment of the sick and to urge the importance and method of dealing with patients. Special emphasis is laid upon the fact that we are not dealing with disease, but rather with diseased individuals, which is quite a different thing. In other words, the question is not what is the treatment of pneumonia, but rather how can we best care for the patient so that he may recover from the disease. The book does not deal with drugs primarily but consists of thirty chapters, covering less than 500 pages, which discuss the treatment of various specific or infectious diseases, including those of the respiratory and circulatory systems, diseases of the blood and digestive systems, and of the kidneys. There is also a chapter upon the therapeutic use of oxygen and the present position of venesection. The closing chapters deal with the functional disorders of the nervous system and with some of the organic diseases of this portion of the body. The book does

not attempt to quote the writings of other contributors in practice and therapeutics except on rare occasions, but is a mirror of what Dr. Rudolph, who is the Professor of Therapeutics in the University of Toronto, believes to be the proper method; or, in other words, the text represents the manner in which he would treat the conditions which he clearly describes and for which he equally clearly indicates the remedies which he believes to be most advantageous. For these reasons the reader is provided with the guidance of one who is recognized as foremost in the department of therapeutics.

GENERAL PATHOLOGY. By Dr. Ernst Ziegler. Revised from the 11th German edition of 1905 by Douglas Symmers, M.D. Illustrated in black and white and colors. William Wood & Company, New York, 1921. Price $7.

For a generation Ziegler's Pathology has been one of the standard works of medicine, and the present American edition has been revised by the Director of Laboratories in the Bellevue and Allied Hospitals, who was formerly Professor of Pathology in Bellevue Medical College, and who is known because of the vigor and accuracy of his work and the numerous contributions which he has made to medical literature within the last few years, utilizing to the full the opportunities which he has had in the Department of Pathology.

The present American edition has been reprinted. Care has been taken to make the English more concise and clear. A number of conditions which have become recognized in the last few years, or concerning which our information has greatly broadened, are thoroughly considered. Many of the old original illustrations have been eliminated, and in their place photographic reproductions from the wards and laboratories of Bellevue Hospital have been introduced. Much space is saved at times by the use of fine print in discussing subjects which are not of prime importance.

The book shows a wide familiarity with current pathological literature, and while a large amount of the bibliography refers to Teutonic work, nevertheless one feels the presence of the American editor by his frequent introduction of English and American references, which add very materially to the value of the volume. If the German publisher would bring out a German translation of the American edition, Teutonic pathology would be materially improved.

CLINICAL OPHTHALMOLOGY FOR THE GENERAL PRACTITIONER. By A. Maitland Ramsay, M.D., with a Foreword by Sir James MacKenzie, M.D., F.R.S. Henry Frowde, Oxford University Press; Hodder & Stoughton, Warwick Square, E. C. 4, London, 1920.

Always the writings of Dr. Ramsay show the influence of the years he spent as "a general practitioner"—an influence which has ever enhanced their value. Richly illustrated, many of the plates being reproductions, and excellent reproductions in color, beginning with a full description of the methodical examination, the accomplished author has produced a book of forty-six chapters which covers the whole field of ophthalmology. Although the book was written for the general practitioner, it is one which should be in the library of every ophthalmologist, who, no matter how wide his experience may be, will find much of importance and satisfying interest. Dr. Ramsay's aim has been, to quote his own words, "to indicate, as far as possible, the cases which the general practitioner can treat safely on his own responsibility, and those in which it is desirable to obtain a consultation with an expert." No one, so far as the reviewer is aware, has ever covered the ground, from this standpoint, so elaborately. With this book in his possession, the general practitioner should never be at a loss what to do in an emergency, and the hope may be expressed that he would never fail to realize how necessary in most of the cases of ophthalmic disease and injuries it is his duty to avail himself of expert advice. Dr. Ramsay's rich experience, not only as a general practitioner, but for many years as an accomplished ophthalmic surgeon, gives this book a value which is peculiarly its own.

G. E. DE S.

A Laboratory Manual and Text-book of Embryology. By Charles William Prentiss. Revised and rewritten by Leslie Brainerd Arey. Third edition, enlarged, and illustrated in black and white and in colors. The W. B. Saunders Company, Philadelphia, 1920. Price $5.50.

This book, originally written by the late Professor Prentiss and first published in 1915, has now reached its third edition, the rapid exhaustion of the second edition requiring that Professor Arey should busily prepare the text for the present issue. When it is stated that the book has been reprinted on several occasions in addition to the editions which have appeared, it is at once evident that it must be of value to teachers of this subject and to their pupils. It is printed on excellent paper, in large type. From the general standpoint, possibly the most noteworthy feature is the excellence of definition in the illustrations, practically none of which are blurred, so that they clearly represent what is seen under a properly adjusted microscope. In many books the reverse is true, and students are disappointed. The book is so attractively printed and the illustrations are so interesting that even those who are not particularly interested in embryology will, if they pick it up, be inclined to read it. While regret is necessarily felt that the skilled author of the original volume could not aid in the preparation of the present edition, nevertheless the present editor has made us recognize the well-known fact often spoken of in military service, to the effect that no one is so good at anything that in the event of his passing away some one else cannot be found to carry on the work.

A Synopsis of Medicine. By Henry L. Tidy, M.A., M.D., F.R.C.P. William Wood & Company, New York, 1921. Price $6.50.

This is a book in which the author has attempted, as he says in his title, to provide a synopsis of such principles of medicine as are of importance at the present time. The general arrangement follows that of Osler's "Practice." In other words, it is what might be called a Practice of Medicine boiled down, and for this reason is anything but readable. It is, however, a book to which the physician may turn when he wants a summarization in a few lines of all the facts concerning most of the conditions which are met with in practical medicine, the more so as it has quite an exhaustive index. Possibly the best way to explain the arrangement of the text is to state that it is like an extended table of contents of an encyclopedia, or to say that it is a book upon the Practice of Medicine concentrated until nothing but cold facts are given in brief sentences and paragraphs.

Tropical Ophthalmology. By Robert Henry Elliott, M.D., B.S. (Lond.), Sc.D. (Edin.), F.R.C.S. (Eng.). With 7 Plates and 117 Illustrations. London: Henry Frowde, Oxford University Press; Hodder & Stoughton, Warwick Square, E. C., 1920.

This volume, the first of its kind on Tropical Ophthalmology, is a welcome addition to the text-books on ophthalmic science. Indeed, it is much more than a "text-book," in that it contains a careful reference to, and an analysis of, the literature of this subject, the wise comments of the accomplished author, and a record of his own extensive experience. The material is classified in ten sections, wherein are discussed, among other subjects, the ocular effects of strong light in tropical countries; the effects of exposure of the eye to wind and dust, including an account of the development of pterygia and the causation of ophthalmia epidemics; injuries of the eye by animals in the tropics; and parasitic diseases of the eye. Naturally, the Indian operation of couching for cataract and the methods of extraction of cataract in India receive full consideration. A special chapter by Col. H. Kirkpatrick on the Madras cataract operation is included in this section. This author also contributes a chapter on the ophthalmoscopic appearances in the tropics. Diseases of the cornea, conjunctiva, lids and lacrimal passages are described, especially from the tropical standpoint, and the book concludes with a discussion of general diseases and their ocular manifestations, such affections as beriberi, leprosy, trypanosomiasis, malaria, and relapsing fever being of special interest. This work is of great value to all ophthal-

mologists, but especially to those whose duties take them to tropical countries. It should be especially valuable to the medical officers of the Army and Navy. Colonel Elliot has done much for the advancement of ophthalmic knowledge, and ophthalmic practitioners in all countries, already largely in his debt, will welcome this new and admirable contribution from his facile pen.

G. E. DE S.

A Text-book of the Practice of Medicine. By James M. Anders, M.D., LL.D. Fourteenth edition, thoroughly revised. The W. B. Saunders Company, Philadelphia, 1920. Price $10.

The fourteenth edition of this very successful book on the Practice of Medicine has been revised by Dr. Anders with the assistance of Dr. John H. Musser, Jr., who also was engaged with him in the revision of the earlier edition. The first point that strikes one in taking up the volume is that although it contains approximately 1300 pages, the paper is so thin that the book is no larger or heavier than many volumes which contain half the text. At the same time the publishers have been successful in obtaining a paper which does not show the register and, therefore, there is no blurring of the type.

Any book which has reached its fourteenth edition in 24 years, and has been reprinted a number of times, must possess certain essential qualities which have made it useful to practitioners in general. The present edition bids fair to maintain the popularity of the work. It is a reliable, essentially practical, and therefore a most useful book covering a wide field in practice.

The Roentgen Diagnosis of Diseases of the Alimentary Canal. By Russell D. Carman, M.D. Second edition, revised. The W. B. Saunders Company, Philadelphia, 1920. Price $8.50.

The author of this book, who is the head of the Section on Roentgenology in the Division of Medicine, the Mayo Clinic, in bringing out the second edition, has added 98 pages to the volume and 122 illustrations. There are two new chapters: One is upon Hour-glass Stomach and the other provides a chronological abstract upon the published work on pneumoperitoneal diagnosis of abdominal lesions. The object of the author has been to arrange in a systematic manner the results of his own experience in such a way as to be of value to those who are interested in this subject, not only as active roentgenologists, but as general medical and surgical clinicians.

The book naturally opens with preliminary pages upon the apparatus which is used, the methods of examination, directions as to feeding, and details as to technique of examining different portions of the body. Quite full bibliographical references are attached to almost every chapter and full credit is given to workers in this field in this country and abroad. The illustrations will, we think, be particularly useful to the clinician who is not practicing roentgenology, since when plates are sent to him by the *x*-ray expert he will be the more able to utilize them in reaching a diagnosis, in that he will be familiar with actual pathological changes and not confuse them with alterations in position and shape which the skilful roentgenologist regards nevertheless as normal.

Practical Psychology and Psychiatry. By C. B. Burr, M.D. Fifth edition, revised and enlarged; illustrated. The F. A. Davis Company, Philadelphia, 1921. Price $2.

Dr. Burr has provided this book for use in training schools for attendants, nurses, and for medical students. He hopes it will be valuable as a ready reference for practitioners. In his fifth edition he has not only carefully revised the text, but paid particular attention to the chapters on Psychiatry and the Forms of Insanity. A new chapter on the Prevention of Insanity has been incorporated. The classification follows that recommended by the National Committee for Mental Hygiene.

We have no doubt that the book will prove of value, as it is intended, for the class of people for which it is designed. It is much too elementary for the trained neurologist and alienist. The fact that it has reached a fifth edition since 1898 indicates that it has proved of value to the readers for whom it has been prepared.